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WORLD PETROLEUM

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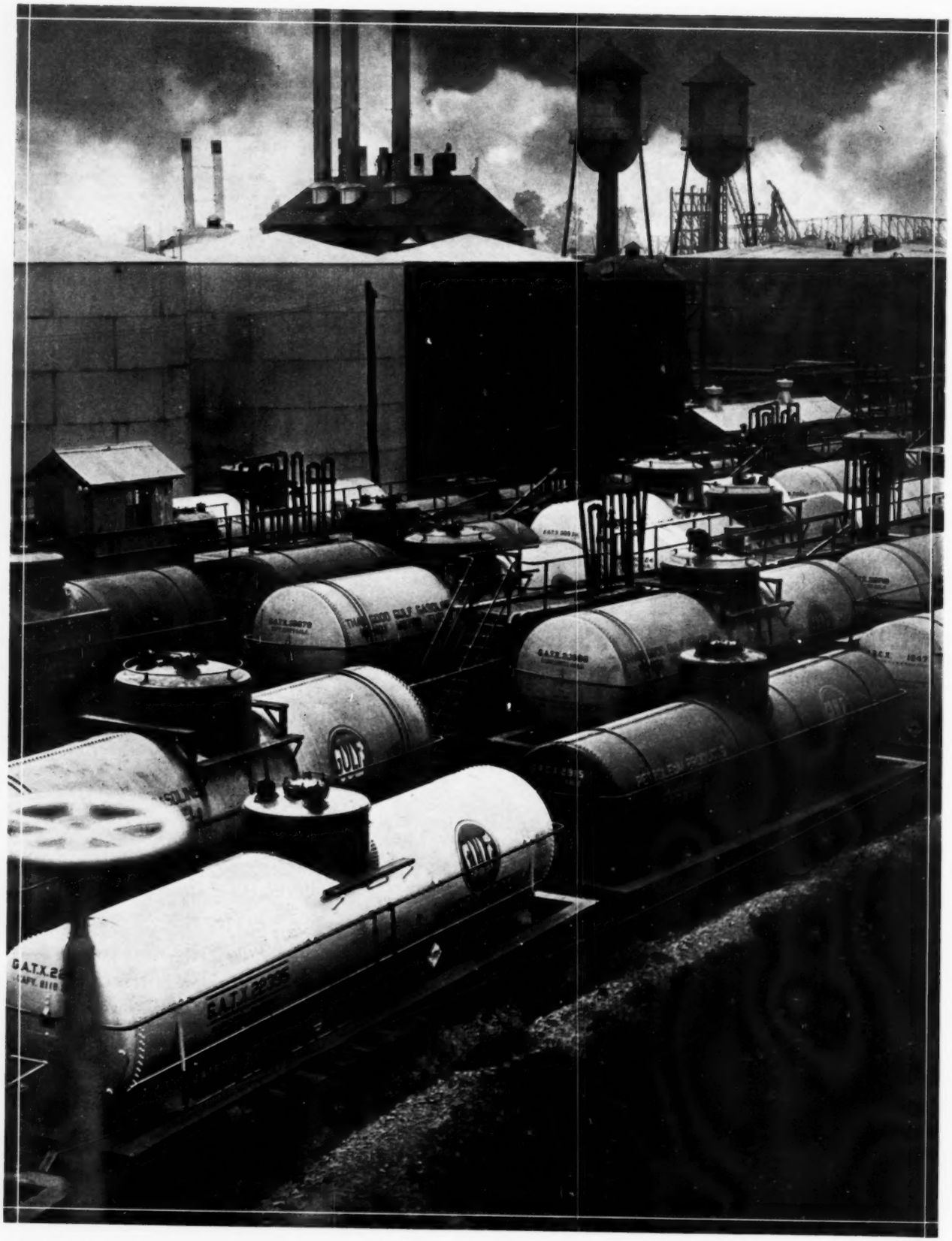

Petroleum product distribution, *Courtesy Gulf Refining Company.* M. Ritasse

NEW YORK • WORLD • LONDON

PETROLEUM

Brisbane Speaks On Oil

ONE man who never minces words, Arthur Brisbane, comments caustically, and not without just cause, on the present state of affairs in the U. S. petroleum industry. "There is strength in unity," he says, "and Sir Henri Deterding has that strength. Our biggest oil company, Standard, is chopped into small pieces to keep it from getting too big. Able men, who in the old days of John D. Rockefeller, Sr., Archbold and Rogers, would have continued building Standard Oil's power, giving Deterding a desperate fight, are now confined to minor activities, busy inventing cunning names for Standard Oil products that compete with each other, bewilder the public and injure Standard Oil. That company needs a lawyer to tell it how to protect itself and its stockholders from Dutch-British competition which is pushing it to the wall."

▼

Today's Situation Forecast

IN view of the statements that have appeared in the pages of WORLD PETROLEUM as to the financial losses and injurious effects upon the oil industry of unsound methods in the marketing of gasoline, we have been interested in reading a report prepared three years ago which directed attention to the seriousness of the situation existing at that time and predicted that the unsatisfactory conditions then prevailing would become more aggravated as time went on. The report was made as the result of an investigation conducted for S. F. Bowser & Co. by Peat, Marwick, Mitchell & Company. While the study was undertaken primarily for its bearing upon the equipment business of the company for which it was made it contains some pungent observations on marketing methods then in vogue, and these remarks are quite as applicable today as when they originally were made.

It was estimated in this report that as a result of the efforts to control outlets for excess gallonage the number of pumps and filling stations was at least three times as many as were really required. "As a result of the attendant waste of labor, supplies and expense," the report continued, "the retail marketing of gasoline and oil to motorists is costing at least three times as much as the retail marketing of parallel products and the marketing end of the business is probably losing in excess of $50,000,000 a year."

The report declared further that the equipment lease system, under which anybody who was willing to dispense gasoline was supplied with a pump and storage equipment at a purely nominal charge, was exercising a demoralizing effect upon the industry, "converting wholesalers into dispensers of subsidies and retailers into demanders of subsidies at the expense of good merchandising and efficient operation in both fields." Attention was called to the fact that indiscriminate expansion along this line without regard to the actual need for the facilities supplied had "opened the retail field to an irresponsible class of station operators whose practices have shaken the confidence of the public in the whole industry."

It was noted by the report that the larger integrated and wholesale oil companies were rapidly expanding their ownership of outlets and were thereby placing themselves in a position to control the service, quality and quantity of gasoline dealt out to the public. This movement toward the direct ownership of retail outlets has progressed much further than it had at the time of the report which is dated December, 1927, but it has not enabled the large marketing organizations to control either the quantity of gasoline sold or the terms on which it is sold. Instead we are witnessing at the present time frequent and widespread price cutting wars that result in heavy losses to all involved and rob producers, in part at least, of the benefit that otherwise might accrue from their adoption of a policy of conservation of raw material.

The difficulty is that the great increase in company-owned sales stations, instead of being substituted for the oversupply of privately operated outlets, has been superimposed upon it. The excess of retail merchandising facilities is greater than ever and the waste from the maintenance of unnecessary filling stations is correspondingly increased. At the same time the wholesalers, through the system of commercial discounts and an excessive spread between wholesale and retail prices, are providing irresponsible operators with the opportunity and the incentive to cut prices below the levels established for their own retail outlets, thereby forcing the latter to engage in a destructive competition directed against themselves.

In what other industry would an uneconomic condition of this sort be tolerated? And why should it be permitted in the

oil industry? The local dealer to whom the sale of gasoline is a side line to some other form of business or who relies for his profit upon what the report from which we have quoted characterizes as "subsidies" cannot be expected to correct the situation. The smaller wholesalers who act only as middlemen are powerless to deal with it. But how about the big integrated companies engaged in producing, refining, wholesaling and retailing? Their executives may be correct in assuming that they can "stand the gaff" as long or longer than their smaller competitors. But, would not their stockholders prefer some temporary sacrifice in gallonage, if necessary, to the fruitless dissipation of legitimate earnings in the unending continuance of wasteful, destructive and senseless competition?

▼

World Wide Expansion

THE trend of future crude production and its relation to the world's markets is outlined in the last issue of THE LAMP, the official voice of the Standard Oil Company of New Jersey. "Since the birth of the oil industry," says THE LAMP, "the United States has supplied the bulk of the world's petroleum. Its fields have been exploited for years and many of them depleted. Producing areas abroad have as yet scarcely been scratched, comparatively speaking, although foreign countries now supply 35.5 per cent of the total and have shut-in capacities of 1,073,000 bbl. daily. All of this points unmistakably to the fact that oil lands outside the boundaries of the United States may be expected to play an increasingly important part in the drama of world's production as time goes on." Recognizing that the oil industry is no longer regional but international, WORLD PETROLEUM'S policy is to cover the major problems of the oil industry of the world.

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Dangerous Practice

THE dangers of tampering with public opinion have just been emphasized to the leading California oil companies in a striking way. Some months ago an enterprising firm of publicity agents approached the leading oil companies with a unique plan for stimulating the consumption of motor spirit. The plan consisted of endeavoring to secure the passage by popular vote of a State law altering the time during the summer months so as to begin the working day one hour earlier and thus leave an extra hour of daylight in the evening which it was assumed Californians would spend in motoring up and down the State's superb highways.

Quite blind to the strong public sentiment against this experiment which has existed in many parts of the United States ever since it was tried out during the late war, the oil companies raised a fund of $50,000 for propaganda. Very little was accomplished, however, for the newspapers of the State, properly gauging the wishes of their readers, consigned most of it to the waste paper basket.

Court proceedings were soon brought by the opposition which forced the filing of a statement showing the source of the moneys being expended, with the result that the oil companies were placed before the consuming public in the unenviable position of being the major force behind a distinctly unpopular movement of a wholly selfish character. As a result, the "Early Rising Law" soon became known in the press as "Oily Rising," and many newspapers, particularly in the country districts administered a series of stinging rebukes to the oil companies. The latter, oblivious to the state of the public mind and deluded by a superficial poll taken at their own filling stations, continued to hope for success until the voters went to the polls.

The final result was a vote of nearly three to one against the ill starred measure. More than three-quarters of a million Californians voted against this proposed interference with their daily living habits. Unfortunately the loss is not limited to the fifty thousand dollars wasted on this will o' the wisp. The oil companies have aroused the enmity and suspicions of three-quarters of a million voters, half of whom must be motor car owners and have atagonized farmers, labor unions, many powerful organizations and a number of individual members of the State legislature.

An effort is now being made to bring production of oil under control by legislation in California, and it will not be surprising when the industry again comes before the legislature for regulation if the public's memory proves long enough to embrace an opportunity to even up the score. The public is far more interested in cheap motor fuel than in saving any industry. The leaders in the petroleum industry everywhere might well paraphrase the old slogan to read "Millions for Defense but not one cent for mischievous propaganda."

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Colombian Oil Laws

PRESIDENT E. OLAYA HERRERA of Colombia seems determined that speedy passing of constructive petroleum legislation is of the highest importance to the future welfare of his country, for he has notified the Colombian Congress that the present session is to be extended one month or until the bill recently drafted is passed. In the interests of Colombia and of oil companies concerned it is to be hoped that the law will be attractive to foreign oil companies, because active exploitation naturally will otherwise continue to be diverted to those countries where the oil laws are more favorable. Some of the larger American companies whose activities are international in scope will soon be receiving crude oil from Iraq, and this must necessarily cut down on petroleum needed from South America. The world consumption is below production. and it had been hoped to keep Iraqi oil in the ground for some time to come, but recent political pressure appears to be too great. Consequently Colombian crude becomes of lesser importance just now. American oil representatives were lately called in by the Colombian authorities to pass on the bill, and which was considered by them to need modifying. Whether this has been done or not is not known, but George Rublee, international attorney, is now in Bogata in an advisory capacity to President Herrera.

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The Tariff Question

WHEN the Committee's tariff report came up for action at the American Petroleum Institute meeting at Chicago 26 directors were absent, and 10 who were present did not vote. The ayes carried 17 votes and the nays 15. The question was, should the Board endorse in principle the imposition of a tariff on crude oil and refined products imported into the United States as outlined in a resolution offered by Wirt Franklin. The resultant consensus of opinion was that the vote was insufficient to constitute a convincing test of the opinion of the Membership of the Board, or to commit the Institute either for or against the resolution. So the resolution was tabled for future consideration. Evidently it is the feeling of the directors that nothing can be gained by hasty action.

Cause of Export Price Cancellation

Price Cutting of Gasoline for Overseas Shipment by Mid-Continent Independents Mainly Responsible for Failure of Association to Function at Critical Time. . . . By C. C. Bailey

Editorial Staff
"The Financial World"

THE Export Petroleum Association Inc. was organized in January, 1929, under the Webb Export Trade Act to promote co-operation in American export trade in petroleum and its products. The members of the Association are given in the following list, as well as the names of the directors of the Association. The positions which they hold with their respective companies are given in parenthesis.

Atlantic Refining Company (W. M. Irish, president)
Cities Service Company (F. R. Coates, director)
Continental Oil Company (W. W. Bruce, vice president)
Gulf Refining Company (G. R. Nutty, president)
Pure Oil Company (Henry M. Dawes, president)
Richfield Oil Company of Cal. (C. M. Fuller, president)
Shell-Union Oil Corporation (J. C. Van Eck, president)
Sinclair Consolidated Oil Corp. (H. F. Sinclair, chairman)
Standard Oil Company of Cal. (K. R. Kingsbury, president)
Standard Oil Company of Ind. (E. G. Seubert, president)
Standard Oil Export Corp. (James A. Moffett, vice president)
Standard Oil Company of N. Y. (C. F. Meyer, president)
Texas Corporation (R. C. Holmes, president)
Tidewater Oil Company* (A. J. Byles, president)
Union Oil Company of Cal. (R. D. Matthews, vice president)
Vacuum Oil Company (James J. Maguire, director)

*Including Associated Oil.

ON November 7 official announcement was made by the Export Petroleum Association, Inc., of cancellation of all of its export price schedules. No explanation or comment has been forthcoming from the Association or from any of its members, and considerable confusion of thought as to underlying causes has been apparent on the outside. Action was anticipated, although not quite so drastic.

Probably the best method of approach in analyzing the situation is to review the conditions leading to the formation of the Association and its objectives. It was organized in January, 1929, by 16 of the most important American oil companies engaged in export, in conformity with the provisions of the Webb-Pomerene Act, which was passed by the Congress of the United States in 1918. This law was designed to permit cooperation among American units insofar as their export activities were concerned without involving infraction of our anti-trust laws which continued to govern relations within the domestic field. Such exemption was considered desirable because of the growing importance of our export trade and the difficult competition in foreign markets from government-sanctioned cartels and other monopolistic combinations in foreign countries. However, in spite of these factors, little advantage of this law has been taken by American industry, the other outstanding example being Copper Exporters, which has continued to function, though with difficulty, throughout the depressed conditions of the past year.

Export Petroleum Association was organized with the aid of counsel who had helped reorganize the Copper Export Association; but it is improbable, however, that anything like the dominance achieved by the latter was anticipated for the Petroleum Association. Copper Exporters has represented practically the entire American copper industry, which has controlled over 80 per cent of the world output and has therefore been quite an important factor in stabilizing domestic prices until recently. However, even with these advantages, its course has not been untroubled and its 18-cent price policy finally came to grief after a year.

By contrast the American oil industry is not such a dominant factor in the world oil situation and is tending to become less so as the years go by. Furthermore, it is a far less closely knit group, having much greater diversity of interests both at home and in its export business. Although the 16 companies now constituting the Export Petroleum Association include practically all of the so-called major units and dominate the export trade of the American industry quite completely under normal conditions, they find themselves in times of overproduction of gasoline in this country facing an important volume of competition from independent domestic refiners, who will dispose of their surplus abroad through independent brokers at cut rates if the Association is unable or unwilling to take it at their posted schedules.

This condition has prevailed this year to a marked extent, and its importance to the Export group is illustrated by estimates revealing purchases by Association members from mid-continent refiners totaling about 175,000,000 gallons for the first ten months of 1930, in comparison with 60,000,000 to 70,000,000 gallons shipped from this territory independently, and apparently for the most part at lower than the posted schedules. Thus the non-association gasoline has constituted an important percentage, and has to a significant extent replaced gallonage in the export markets that would normally be held by some of the Association members. Such members have naturally desired to meet this competition and retain their markets, while the unaffected members have not wanted to reduce their profits by revising posted prices downward.

There is little to published reports emanating from London that recent strong competition from Russia, such as the sale of 20,000,000 Imperial gallons of gasoline to a Mid-England bus company at 19 cents, was a direct cause. While similar factors may not have been entirely out of the picture the real cause was the foregoing domestic side of the export situation.

This difference in objective, arising out of competition from within the American industry, seems to have been the most important proximate cause of the decision to discontinue what is probably the most important function attempted by the Association, i.e., the regulation of export prices. To what extent this is merely outward recognition of already existing failure to actually maintain the schedules, it is difficult to estimate, although reports have been current that considerable shading from the posted prices by members of the Association had been going on for some time.

It is generally conceded that the Association has been handicapped from the beginning in its efforts to keep prices

satisfactory to all, and it is not difficult to understand how differences might arise in this connection. Those members with primary interests in this country would desire to see the export prices maintained as high as possible for the sake of the supporting and stabilizing effect upon domestic prices, while those whose export trade is highly competitive with such countries as Roumania and Russia would tend to need lower prices to maintain their competitive status. To further complicate the situation those companies owning directly, or having affiliation with, refining facilities in other countries are able to secure the flexibility in prices necessary to hold their outlets through use of this foreign supply without conflicting with their direct obligations to the Association.

All these differences have made it difficult to secure sufficient flexibility in the schedules, since the by-laws of the Association provide that unanimous consent of all members is necessary to any change in posted prices. Thus, when competition from within the American industry became more and more serious due to continued overproduction of gasoline, the inevitable result was a breakdown of the price-regulating function of the Association regardless of the special advantages it enjoys under the law. No direct intimation of permanent dissolution has been given, although opinion has been expressed in some quarters that such will be the unavoidable sequel. Whether the Association can perform sufficient valuable service, apart from price agreement, to justify its continued existence is open to question. But, there appears little basis for expecting reassumption of price fixing functions, at least until the industry has overcome its overproduction handicap and worked itself out of its present chaotic state.

A closing reference to the relation of this development to a possible outbreak of world-wide price cutting on a drastic scale may be justified because of the fears of such a possibility that have been publicly expressed. The entire industry, and particularly the American portion of it, has been subjected to declining price trends this year, and even the best prices of last Spring made unfavorable comparison with the previous year. Lower price levels have been the necessary accompaniment of overproduction, and even further readjustments may be required before the proper balance is achieved. If we have interpreted failure of the Export Association rightly it is in the nature of a sequel to the conditions that have permeated the industry, rather than an initial development leading toward a demoralization of prices, which could only prove ill-considered and unavailing for the solution today.

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Mexico's Improving Oil Industry Conditions

Special Abstract of Official Report of President Ortez Rubio To Congress. Unit Operation of Oilfields Will Be Favored. (Translated From Spanish.) . . . By Ing. Enrique Ortiz

Senior Acting Officer
Department of Industry and Commerce
Mexico City

IN his annual report for 1930 to the Mexican Congress the President of the republic took occasion to review the past and present conditions of the Mexican petroleum industry, and to outline the program of the reorganized *Departamento de Petroleo*. On its juridical side the domestic industry now has a troubled past behind it. A ten-year struggle to remove sources of irritation and injustice that had accumulated about Mexican petroleum legislation is finished; all petroleum enterprises now operating in Mexico have the benefit of uniform legislation which stabilizes vested interests. The way is now open for the *Departamento de Petroleo* to devote its attention to the solution of technical and economic problems that have been held in abeyance pending solution of difficulties in the legal and political order, although the Department still has before it an enormous routine task in regularizing existing petroleum concessions. The status of 1,143 concessions affecting a total area of 11,160,000 hectares has now been definitely fixed.

The new program of the Department comprises introduction of certain modifications into the existing petroleum regulations with the view of bringing these regulations more in accord with business principles as regards imports on concessions, royalties, inspection quotas, etc. Much emphasis is to be laid on measures designed to secure unit operation of petroleum deposits, especially in those cases that affect national petroleum reserves. Measures of conservation are to be studied from the point of view of appropriate use of the products. Official specifications and regulations affecting gasoline are to be set up for the protection of the public against adulteration and falsification of this commodity. A campaign of education and instruction is to be inaugurated to promote the efficient use of all kinds of petroleum products within the country.

The *Departamento de Petroleo* intends to lend all possible aid to facilitate transportation and distribution of petroleum products to the domestic markets. The construction of pipe lines and refineries is to be favored as one means of increasing the consumption of Mexican petroleum in Mexican territory.

The question of national petroleum reserves is to receive careful attention. One of the functions of the recently created technical economic petroleum commission, staffed by competent engineers in the Department, will be to conduct surveys and explorations to ascertain what lands should be set apart for these reserves.

Although on its economic side the Mexican petroleum industry has labored under adverse conditions too well known to require mention, this has not prevented execution of important explorations bearing on the future development of the industry. Petroleum surveys have been carried out along the northern frontier, in the region south of the Rio Tuxpan, in Tobasco, Chiapas, and on the isthmus of Tehuantepec. Geophysical methods have been mainly used in these surveys, and during the past fiscal year

have resulted in bringing in 84 wells with an initial daily production of 82,694 barrels.

The statistical matter accompanying the report gives a general idea of the scope and tendencies of the industry. The total production in 1929 was 44,687,879 bbl. Although this is only 3 per cent of the total world production, it is sufficient to give Mexico fourth place among producing countries. During the first six months of the present year production has been on a slightly smaller scale proportionally (20,438,538 bbl.). In the 29-year period since 1901 the production of the Mexican oil fields has amounted to the grand total of 1,580,325,466 bbl. (290,162,733 tons approx.). Exportation has of late been considerably less than total production. In 1929 there were exported 27,039,622 bbl. and in the first half of 1930 only 13,549,905 bbl.; these figures include exports of both crude oil and the products of Mexican refineries. There are now 18 petroleum refineries in Mexico, some of which confine their operations to crudes and others to the recovery of gasoline from natural gas. The combined daily crude capacities of all these refineries is 334,150 bbl. The production of gasoline from natural gas in 1929 amounted to 118,000 bbl.

The Mexican petroleum industry is supplied with an ample equipment for handling its production. The pipe-line system now stretches over a total length of 5,144 kilometers, with a total daily capacity of transporting 2,876,656 bbl. from the oil fields to the ports of shipment. Of this pipe line system 356 kilometers were built in 1929 including a gas main 165 kilometers long for supplying the city of Monterey, and another gas main 60 kilometers long between the Tonala field in the isthmus of Tehuantepec and the refinery at Minatitlan.

For storing the products Mexico now has 2,482 tank farms constructed mostly of steel, with a capacity of 81,408,275 bbl. During the past year 1,200 new storage tanks were built with a total capacity of 769,764 bbl.

In 1929, Mexico itself consumed 11,141,962 bbl. of its own crude and refined products. A certain amount of petroleum products was imported to meet the requirements of Northeast Mexico.

It is noted with satisfaction that as a consequence of increased road construction and repaving in the cities the domestic consumption of gasoline has risen from 179,812,044 liters in 1926 to 259,287,427 liters in 1929. This consumption is bound to increase as the present program of road building is being further developed. The Department is making special plans to improve the means of supplying gasoline to the regions lying within the Central Plateau.

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Papers at the A. P. I. Meeting

Space does not permit reproduction of the various papers read at the recent American Petroleum Institute Meeting in Chicago. The following is a list of the papers and names of their authors.

Influence of Fire Hazards in the Petroleum Industry. By—C. H. Haupt, Standard Oil Development Co., Elizabeth, N. J.

Fire Prevention. By—R. A. Wotowitch, Cities Service Co., New York, N. Y.

Underground Corrosion. By—K. H. Logan, Bureau of Standards Underground Corrosion Section, Washington, D. C.

Disposal of Production. By—V. L. Martin, The Prairie Oil and Gas Co., Independence, Kans.

Land and Lease Aspects of Unitization. By—John P. West, The Prairie Oil and Gas Co., Tulsa, Okla.

Economies of Automotive Transportation. By—A. F. Coleman, Standard Oil Co. of New York, N. Y.

Pipe Protection—Why and How. By—W. H. T. Thornhill, Underground Pipe Protection Institute.

Determination of Evaporation Losses. By—George W. Chenicek and Walter G. Whitman, Standard Oil Co., Whiting, Ind.

Flue Gas for Reducing Fire Hazard. By—A. E. Pew, Jr., Sun Oil Company, Philadelphia, Pa.

Protecting Tankers With Flue Gas. By—H. H. Hall, Standard Oil Co. of Calif., San Francisco, Calif.

Safety Mindedness, a Profit Factor in Marketing. By—G. S. Boetsma, Standard Oil Co. of New Jersey, Newark, N. J.

Progress Toward a Uniform Method of Measuring Detonation. By—T. A. Boyd, General Motors Corporation, Detroit, Mich.

Advertising Value of Automotive Equipment. By—Charles H. McBurney, Marathon Oil Co., Tulsa, Okla.

Selection of Oil Well Casing Based on California Practice. By J. R. Gignoux, Shell Oil Co., Los Angeles, Calif.

Soil Corrosion Causes and Predetermination. By—Joseph F. Putnam, Standard Oil Co. of Cal., San Francisco, Cal.

Aircraft Diesel Engine Fuels. By—W. H. Graves, Packard Motor Car Co., Detroit, Mich.

Catalytic Reactions of Organic Sulfur Compounds. By—Hugh S. Taylor, Chairman of Central Petroleum Committee, National Research Council.

Meaning of the Gasoline Distillation Curve. By—Graham Edgar, Ethyl Gasoline Corp., Yonkers, N. Y. J. B. Hill, The Atlantic Refining Co., Philadelphia, Pa. T. A. Boyd, General Motors Corp., Detroit, Mich.

Improvement in Production Practice. By—W. W. Scott, Humble Oil and Refining Co., Houston, Texas.

Mechanics of Oil Well Pumping. By—H. E. Dralle, Westinghouse Electric and Mfg. Co., E. Pittsburgh.

Corrosion of Production Equipment. By—Sub-Committee on Production Corrosion, J. C. Askam, The Ohio Co., Eastern States.

Automotive Route Studies. By—Eugene Power, Union Oil Co. of Cal., Los Angeles, Calif.

Some Aspects of the Application of Hydrogenation in Oil Refining. By—R. T. Haslam, Standard Oil Development Co., New York. R. P. Russell, Hydro Engineering and Chemical Co., Elizabeth, N. J.

Prevalent Problems of Business. By—Philip R. Clarke, Central Trust Co. of Illinois.

Unit Operation. By—Geo. Otis Smith, Director, U. S. Geological Survey, Dept. of the Interior.

Practical Application of the Code. By—J. T. Dyer, Sinclair Refining Co.

Spirit of the Code. By—E. C. Hall, Standard Oil Co. of New Jersey.

The Anti-Trust Laws. By—Col. William J. Donovan.

What's the Matter With the Petroleum Industry. By—C. B. Ames, Vice President, The Texas Company.

Control of Color of Petroleum Oils by Acid Treating. By—H. M. Weir, W. F. Houghton, and F. M. Majewski, The Atlantic Refining Co., Philadelphia, Pa.

▼

Russian Competition

SALES of gasoline at low prices in European countries by the Soviets is now beginning to make itself felt.

Royal Dutch-Shell Replies to the Soviets

Figures Quoted by N. Tolstonogov of the Soyuzneft in November World Petroleum Declared Misleading, and that a Settlement is Approaching.

. . . ***By Sir Henri W. A. Deterding K.B.E.***

Managing Director
Royal Dutch-Shell Group

I HAVE read the article entitled, "Soviet's Official Answer to the Royal Dutch-Shell" by N. Tolstonogov, consulting economist of the Soviet Government in Moscow, and published in the November issue of WORLD PETROLEUM, to which the Editor has afforded me the opportunity to reply.

1. I think I cannot do better than quote the following extract from an Article, which appeared in THE TIMES of November 1st, about the value of the rouble:

"A paper rouble will buy, in the free market in Russia, not much more than one-tenth the commodities that 2s. 0½d. or its par equivalent, will buy outside Soviet Russia. There is an obvious link between this and the fact that whereas 9½ roubles to the pound is the official compulsory rate of exchange, a person in possession of a £1 note in Russia can obtain for it, from illicit dealers, 60, 80 or 100 paper roubles."

If the value of the rouble is kept in mind there is nothing left of the brilliant wages of which Mr. Tolstonogov speaks.

2. The Soviet spokesman seems more impressed by the Russian oil industry's expenditure than by its achievements, and conveniently compares 1930 with 1913. Why not 1813?

3. For all practical purposes the Dutch East Indies have been exploited as long as Russia. It is childish to compare the results of one specially chosen oilfield in Russia (Grozny) with the average of a whole country; we did not take one special field in the Dutch East Indies.

4. Anybody who knows anything about oil, and the management of the Russian oil export business, knows that the profit figures quoted by Mr. Tolstonogov are grossly misleading. But that *some* profit is got out of the sweat and tears of the poor Russian people by their scourge-equipped slave drivers is not unlikely. The historical comparisons are just as impressive as those under Point 2.

5. A country that starves its population of light and heat by exporting needful oil products rather than meeting the first needs of its own population, that also exports wheat and lets its own people go hungry and cold, cannot ask to be heard for explanation of these self-condemning facts.

However, the day when the Russians will ask for a settlement of the accounts of their executioners is approaching.

That, as far as Mr. Tolstonogov's Article is concerned.

For the American oil men I should like to quote here an estimate of the production of 1930 as compared with the year 1929, made by V. H. Garfias, the manager of the Foreign Oil Department of H. L. Doherty & Co:

Country	1930 in percentages of 1929	1930 (est) (Bbls.)	1929 (Bbls.)
United States	93⅓	937,000,000	1.007.323.000
Venezuela	101	139,000,000	137,472,000
Russia (a)	126½	126,000,000	99,507,000
Mexico	92	41,000,000	44,688,000
Persia	104½	44,000,000	42,145,000
Netherland & Dutch East Indies	100	38,000,000	38,072,000
Roumania	118	41,000,000	34,689,000
Colombia	98	20,000,000	20,385,000
Peru	97	13,000,000	13,422,000
Argentina	96	9,000,000	9,391,000
Trinidad	106	9,200,000	8,716,000
India (British)	86	7,200,000	8,366,000
Others	97	19,600,000	20,275,000

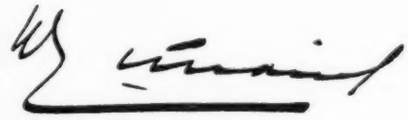
(a) Exclusive of Sakhalin.

From this statement it is clear that, with the exception of Russia, the whole world is at present trying to avoid overproduction of oil. Overproduction of any commodity is bad for everybody, but overproduction of oil is a double waste, because every ton of oil that is burned is burned forever, and, if, whilst being used it does not produce value, it is a loss forever.

In Venezuela and Roumania the Royal Dutch-Shell group have taken the initiative for more restriction. This initiative, however, has only been partly successful. We hope however, to continue to use our influence in the interests of world economy.

Russia is the only country that boasts of increasing its production combined with dumping in order to impoverish the world still more than it has done already. Following this policy the Bolsheviks have even shipped gasoline all the way from the Black Sea, and imported it into U. S. A.

How long is the rest of the world, whose activities are directed to production of wealth and the improvement of the standard of living of everybody, going to stand this festering sore in its midst?



5th November, 1930.

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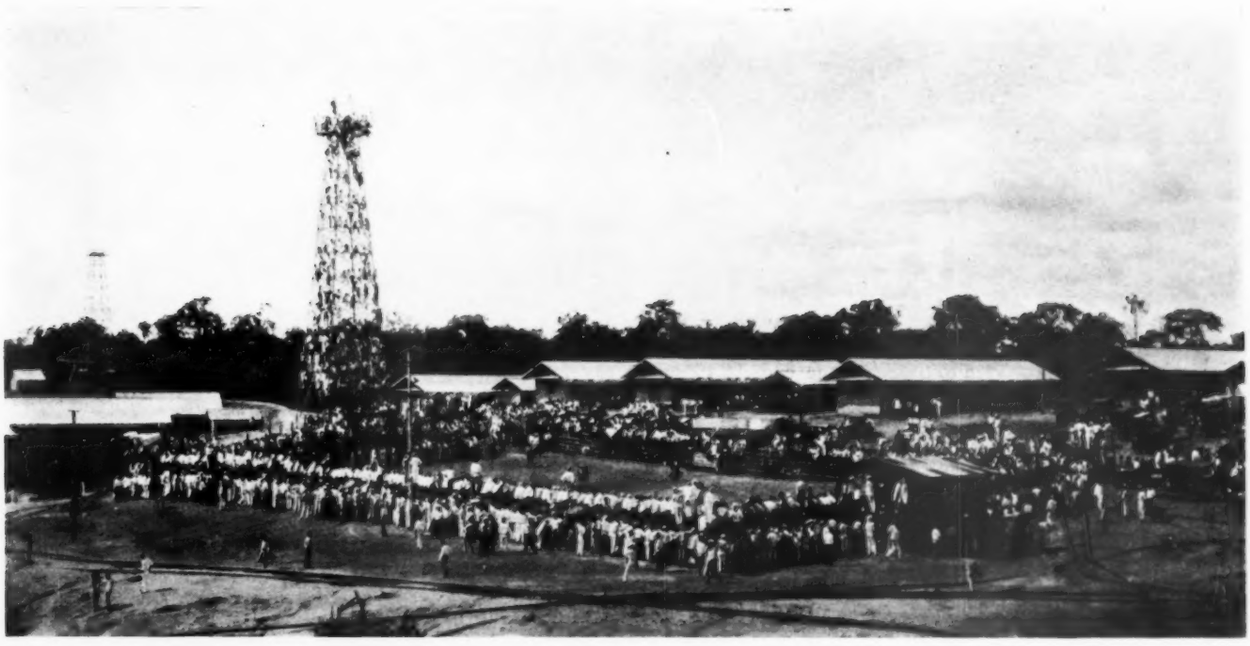
Arrears in Activities of the Various U. S. S. R. Petroleum Divisions

(See page 566)

Drilling	Schedule	Actually Accomplished	Arrears (Per cent)
Distance in meters	200,119	172,621	13.7
Rotary rig-month	2,461	2,281.8	7.3
Drilling speed in meters	83.5	75.7	7.8
Estimate in roubles	12,564,400	12,587,233	0.2
Cost: Rig-month in roubles	5,427.4	5,804.3	6.9
Cost: Distance in roubles	64.6	74.8	15.8
Labor Efficiency, per cent	3.66	2.8	23.0

Production	Schedule	Actually Accomplished	Percentage of schedule
Total production in tons	4,934,297	4,702,128	—4.8
Exploited well-months	15,711.3	16,194.4	+3.1
Produced per well-month in tons	275.28	251.85	—8.5
Exploitation cost in roubles	15,013,000	15,641,000	—4.1
Cost per well-month	838.5	842.1	—0.4
Cost per ton	3.05	3.34	—9.5
Labor applied	5	4.73	+5.4

Refining	Tons	Tons	Percentage
Crude refined	3,433,984	3,494,300	101.6
Gasoline skimmed	41,766	65,726	157.36
Totals	3,480,750	3,560,026	102.28



Employees of the International Petroleum Co. at El Centro, Colombia, watch a bull fight. Evidently some prefer the safe position on the oil derrick.

Tropical America and Oil Workers

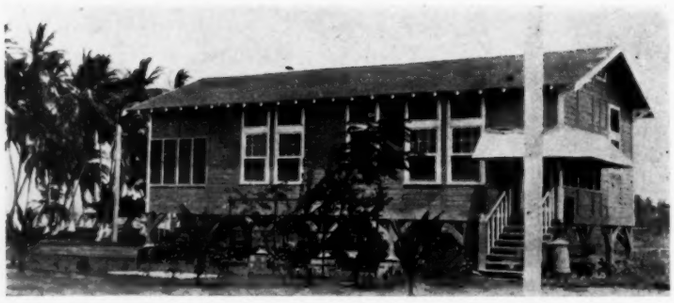
Normalizing the Lives of Officials, Employees and Their Families In the Oil Fields and Refineries Hundreds of Miles From the Centers of Civilization.

By D. M. Veysey

WHILE seldom as adventurous as supposed, "imported" employees find life in the South American oil regions naturally differs from that to which they are accustomed. This is largely due to the fact that most of the petroleum beds in South America and adjacent Trinidad have been encountered at some distance from the largest cities or centers of advancement,—distance being better reckoned by facility of travel than by mileage. Circumstances thus, as a rule, force the companies to establish self-contained, privately developed colonies, standing apart from the life of the country in such respects as do not conflict with its essential laws. Some of these camps are located at the end of miles of trail cut through the jungle, and consequently offer vast problems to the development companies.

The companies, whether producing or refining, realize that the best work is done when employees are not distracted by the novelty of the life around them. Unquestionably the millions of dollars spent raising the standard of the oil worker's life have increased the efficiency of every dollar spent in developing the various business angles of the industry. One oil company operating in

Swimming pool and bachelor hotel of the Caribbean Petroleum (Royal Dutch-Shell) at Maracaibo, Venezuela.



Guest house of the Venezuelan Gulf Oil Corp., Lake Maracaibo, where the Editor of World Petroleum stayed.

Colombia spent over sixty million dollars before a barrel of oil was piped to the sea.

While the modern oil camp is not intended to be a high-brow institution, it is, nevertheless, a far cry from those lurid conditions when an expert driller had also to be an expert in the art of self-defense, and a "rough-neck" was exactly that. Nowadays when a man signs a contract for oil work south of the Rio Grande, he is reasonably sure of the following features, in proportion, to the age and permanence of the "location": — transportation, comfortable quarters safeguarded by sanitation, hospitals, expert medical attention, familiar food, and a wholesome social life. If married, he knows that he may take along his family, as the life has been made suitable and pleasant for them. He knows that some oil companies ship all their food and water from the United States.

As is obvious, the extent to which a colony has been developed depends on the length of time that the field or refinery has been working, the extent of the output and the length of time that the enterprise may reasonably be expected to last. The colony may be only a cluster of "close-to-nature" huts in the midst of a new derrick farm; but, be it ever so humble, it is provided with the decencies of life; pure water, plumbing, electric lights, screening, ice, roads and transportation facilities. These are the civilized worker's household goods, which he expects to accompany him wherever he goes en masse, and upon which are founded his morale, the point of view that he brings to his work, as well as his continued capacity to execute that work.

So it has come to pass that the best is none too good for the oil worker. He thinks so and the company knows so. But no one really grasps the significance of these improvements as do the old timers, men who blazed the trail in

One of two schools built for employees' children by the Pan American Petroleum Co. at St. Nicolas, Aruba.

the oil game, who arrived without being expected and without knowing what to expect, wrestled with strange customs in a strange language, yet got things done. In those days a man had to overcome his environment before he could get down to business, a circumstance unavoidable at that stage, but under normalized conditions, to-day's employee can settle down to work almost at once.

His way is paved from start to finish. Transportation is arranged by the company, often on its own boats. At the end of the line he is met by a company agent, who serves as a buffer between the newcomer and the port authorities, so that he experiences no difficulties arising from the many unfamiliar and often complicated regulations and dialect. In fact, unless his particular type of work brings him into much contact with the local inhabitants, the chances are that he will never learn more than a few words of the local tongue.

If he is a bachelor, he is assigned to quarters in the staff house or "barracks," taking his meals at the messroom. With some oil companies, the employee is "found" in all items: food, lodging, laundry; with others he pays a nominal fee for them. In times past, when there were inadequate colony quarters to house all their men, and operations were in or near a town, some companies provided surplus men with a liberal living allowance in lieu of the above. Groups of employees would thus try "baching" together in a rented house, with a native cook to look after them. In addition to the salary of servants, allowance had to be made for their prevalent custom of making a profit on all purchases for the house. Nevertheless, even when such ventures were not financial disappointments to the men, there were other complaints. It was not like eating and sleeping in a place run under the direction of trained and capable stewards, with every obtainable resource and convenience to draw upon; nor were the native laundresses pre-

Tropical storms rage, but the club entertainment carries on, . . Lake Maracaibo, Venezuela.

Tennis courts and club house for employees of the Apex Company, Trinidad, amid the derricks.

The ball game has its enthusiasts among Pan American Petroleum employees on the island of Aruba, D. W. I.

pared to turn out the type of work done at the well-equipped company laundries.

Young women, too, find working for tropical oil companies, in secretarial or nursing capacities, both interesting and lucrative. Moreover, the protection afforded them by the colony life not only insures their health and welfare, but in view of local custom, provides practically the only way in which an unmarried girl can make her own living in Latin America without losing caste. In addition to all the amenities of life offered them by their employers, the girls are much in demand in camp circles, have a wonderful time, and generally end their business careers by taking charge of a tidy company bungalow and a husband enlisted from the ranks at the bachelor barracks. Normalized, oil field life has not ceased to be romantic and the lure of a tropic moon is very powerful.

The companies recognize that family life is the most effective stabilizer, or normalizer, of all, a point which hardly needs comment. As soon as practicable they do whatever they can to make colony life suitable for the wives and children, even in remote, or isolated places, for it is there that the presence of his family can mean most of all to the employee. With the exception of field geologist, for which position a bachelor is usually preferred, no discrimination is made against married men in selecting the staffs for the tropical oil industries.

For the inhabitants of the well-developed oil colony, the effort of living has been reduced to a degree that is the wonder and envy of others of their nationality engaged locally, but in different occupations, and left to make their own way. An oil worker and his wife are provided with a comfortable, screened bungalow having three, four or more rooms, a bath and shower and an ample porch. The average field colony is composed of wooden houses set on oil protected piles to guard against insect pests, but the newer houses of some of the well-established companies are of stucco. Care is usually taken by oil companies to build their settlements on the water's edge or on a hill where the cool breezes blow at night.

All the large pieces of furniture being supplied by the company, the employee has only to furnish such readily portable articles as bedding, table-ware, and decorations, for which a couple of trunks are usually adequate. Effects of climate favor simplicity rather than elegance in household details; but this in no way precludes attractiveness, a mat-

What could be more attractive than this employee's bungalow at the La Salina camp of the Lago Petroleum Co. on Lake Maracaibo, Venezuela?

A street in the Bella Vista terminal of the Venezuelan Gulf Oil Corp. The houses are American built.

ter resting upon the dexterity of the occupants. Some of the most appealing homes in tropical America are to be found in the oil colonies. Many are surrounded by attractive flower gardens blooming the year-round.

Every morning the company ice man delivers the day's allotment of sanitary ice. Good water from company wells, stored in the conspicuous water towers, or distilled water from the steam evaporators, and electric current, often from the company's dynamos, flow plentifully for a nominal charge, or entirely free. The company commissary sells supplies and specialties to the colonists at a trifle above cost, ordering the familiar articles used back home, and thus contributing to the normalizing process. Compare this with the case of a person not living within the colony precincts, such as an equipment manufacturer's salesman. He has to arrange everything for himself, whereas the colonist has practically everything arranged for him. His cost of living is higher in every way, though the standard of living he achieves unassisted may not be as high. Most of what he wants to buy having to be imported, it is priced to cover duty and shopkeeper's profit, is sometimes difficult to obtain, and not always of guaranteed quality. If he lives in a hotel it is in a nearby native town where it is very hot, and the accommodation usually very crude.

Due to the low wage scale for female labor, practically every household in the tropics has a servant, who, though admittedly not up to northern standards, is able, considering the simpler, more leisurely style of living, to perform the menial tasks, and is sometimes capable of training. This, together with the convenience of being able to send the heavy washing to the company laundry, reduces to a minimum the duties of the oil worker's wife, and assures her of plenty of time for rest and recreation. Her husband, who as a rule is employed for a five-and-a-half day week, while sometimes working the usual number of hours, starts and is through earlier in the day, so also enjoys plenty of leisure.

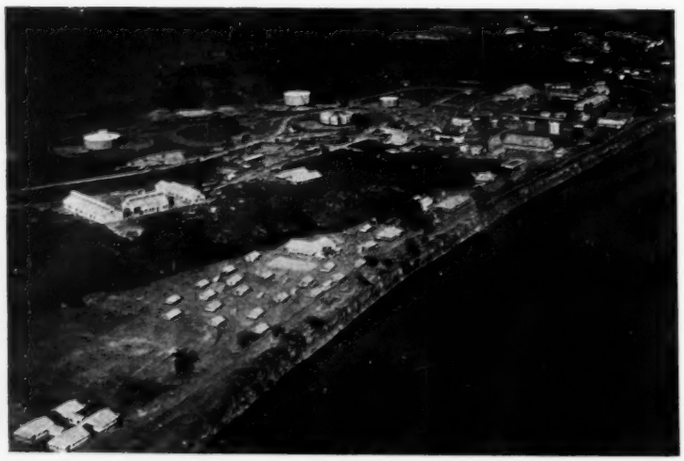
The result is that "clubs are trumps" in the tropics. Nowhere is the club more indispensable, nowhere does it more fully carry out its manifold possibilities as a community center. The reasons are various: some colonies are isolated from other means of amusement; inability to understand the local language prevents many colonists from enjoying native forms of amusement in nearby towns; throughout the tropics there are fewer commercialized kinds of entertainment, the tendency being mainly toward the social types of diversion, or making one's own fun, as the participants express it. The colony club, built and backed by the company, affords a wide variety of recreation for all types of people, at less cost than club membership usually incurs, thus making it possible for many people who have never belonged to a club elsewhere to enjoy such privileges. Yet such a club is not easy to maintain because of the constant changes in the oil companies' personnel, such as drillers, tool pushers, riggers and mechanics.

To the club the wife repairs for morning golf or tennis, afternoon bridge, is joined by her husband for tea, and perhaps a swim in the club pool before dinner. Tom Thumb golf has also found its way into at least one of the tropical countries. Free movies, frequent dances, fairs, reading rooms, billiard and card rooms, swimming pools and the like offer a vastly different atmosphere from that of the past, when the village bars were the only fraternizing places available to lonely, restless employees. Although the dry law is not enforced, blatant abuse of privileges is not tolerated by the oil companies.

Six-room, one-family bungalow at Aruba, D. W. I.

Sometimes the club is also used in connection with education and worship. As a rule there are few enough children in a colony to be placed under the care of an employee's wife with teaching experience, and a club room is large enough to be used as class room until the children are sufficiently old to be sent to school in their own country. Several oil camps have proper schools. Multiplicity of creeds makes it impossible for a company to do much in regard to religion except to offer its club rooms for meetings which the employes arrange on their own account, or assist in building a community church such as the project now under way in Maracaibo.

In connection with this subject the mind naturally reverts to Maracaibo

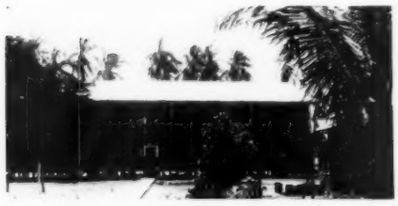


Settlement of the Tropical Oil Co. on the banks of the Magdalena river, Colombia.

District, where, as the largest center of the oil industry in tropical America, the development of advantages for those concerned therein has been very extensive. One of the most striking features of a visit to this region is a tour of the various field colonies along the palm-fringed lake, as well as the office staff communities, which appear like modern California towns along the outskirts of South America's most picturesque city. Undoubtedly the most beautiful of the clubs is at one of these city colonies, although, with the building scheme now in progress, at least two rivals may be completed in another year. Connected with the same club is a very successful amateur dramatic society, unique in that part of the world. This organization, with an orchestra composed of employees, tours the fields periodically. Athletic sports of all kinds, too, are carried on to a degree which culminates in a yearly inter-company tournament.

Refinery employees' club house on the island of Aruba.

Venezuelan Gulf offices at Maracaibo are modern and substantial.



Bachelor barracks at La Salina, Venezuela.

How employees of the Royal Dutch refinery at Curacao are "driven" to work.

Baseball under the shadow of an oil derrick in Colombia, South America.

Before the days of company clubs around Maracaibo, the oil men themselves got together and formed the Maracaibo Country Club, which, because of the vast and varied number of people who have visited it, is perhaps the best known institution of its kind. The value of this club was so well recognized that it has received the support of members of every oil and supply company in Maracaibo.

An epic in oil history has been the development of Aruba, where two refineries are now established, while that of the longer established Dutch Colony on the neighboring island of Curacao has been almost as striking. A peculiar feature of Aruba is the three-story apartment houses towering over the bungalows in the residence quarters. The big refinery on the island has 2,000 employees, including colored employees who have their own quarters. Similar developments on a smaller scale are to be found in Eastern Venezuela, Trinidad, and Colombia.

Fortunate indeed is the dweller within the gates of the oil colony, where, to a remarkable degree, he lives as his own national customs dictate. The only complaint, when any is voiced, is that a colony is too much like a small town. Maybe that is partly because they all have their gossips and even scandalmongers. It wouldn't be human otherwise. That it is preferable to be thrown too much together than to be thrown upon one's own resources is, however, the consensus of opinion among those who have tried both states. Once accustomed to colony life in the tropics, the oil workers find other modes of existence elsewhere so much less gratifying, that, as the saying is in Maracaibo—"They always come back."

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Airey on Crude Oil Price Cut

It is the opinion of Richard Airey, president of the Asiatic Petroleum Company in New York, and also director of the Shell Union Oil Corp., that the recent price cut in the Oklahoma market, was a serious mistake. "It penalizes," says Mr. Airey, "the small producer of crude petroleum, whose sacrifices have contributed to the curtailment of production effected this year by the industry. The little fellow has curtailed production 50 per cent, and there must be further curtailment before conditions in the industry will be rectified. He should be compensated for his sacrifices by higher prices, instead of being penalized."

It is also Mr. Airey's contention that with the usual winter's decreasing consumption, refineries should be cutting down on their gasoline output.

Unit Operation Solution of Overproduction

President E. B. Reeser In Annual Address To American Petroleum Institute Advocates Unitization As Answer To Today's Situation. Main Points of His Speech Are Given on This Page.

RE-ELECTED president of the A. P. I. for another term, Mr. Reeser faces a critical and sensitive condition in the oil industry where bombshells rather than fireworks may break out internationally at any moment. Boldness, strength of purpose and balanced judgment are essential to produce wholesale following to leadership. Mr. Reeser speaks commonsense plainly as behooves a leader. Because the entire industry now realizes the great importance of imediately putting its own house in order, affairs are far more likely to proceed along smooth channels to a normal and sound position than to become further disorganized. Complete elimination of individual company selfishness, however, is absolutely essential.

WHAT is the outlook for the petroleum industry? Millions of stockholders and owners of petroleum securities are tremendously interested in the correct answer to this question. Whether the world's basic industries are to operate profitably or not is always of vital concern. In common with the rest of them, the petroleum industry lately has been dissipating its capital investment by disposing of its products either at or below cost, due to excess production either of raw material or of manufactured products, or both.

The answer would depend upon two things; namely, the rapidity with which general business conditions improve and the ability of the producers, refiners, and marketers who compose our industry, to adapt their mental operations and company policies to the changed conditions under which we must operate. In my judgment, the latter is the more important of the two. I believe the common sense of the men engaged in the petroleum industry is equal to the test.

Momentarily, the demand for petroleum products is not keeping pace with production; but for the petroleum industry there is one underlying factor of safety. It is certain that petroleum products will relatively be in ever-increasing demand. The point of a permanently saturated market is far removed. But, let us in the industry not be lulled into any false sense of security by the broad vista of future demand, nor be deceived by the golden glow of the high sun upon the canvas. No one need have fear for the fundamental soundness of the petroleum industry as such. It is a restoration of prosperity for men and units engaged in the industry we must presently seek. To find that, each of us must face facts as they are in order to determine things as they ought to be. We should, and must, apply to the oil business sound principles of economics. When one sells below his cost of production, he is dissipating his capital; and sooner or later, if he continues to do so, he must inevitably fail in business. If he sells above his costs, he makes profits and succeeds in business. Every man who is both an oil and a business man should follow a stated rule, namely, to produce no more crude nor refine any more products than he can currently sell at a profit.

E. B. Reeser, President for Third Term, American Petroleum Institute.

Photo. Blank & Stoller

Stocks of crude and refined petroleum products above-ground constitute, in the last analysis, available supply ready for the market at some price. Every barrel in excess of actual working stock required as a reserve margin of safety in operation is actual excess supply. It is what the economist would probably call the "marginal increment," and should be reduced in an orderly fashion at the earliest expedient opportunity. With knowledge of the existing condition of supply and demand, no economic reason can be found, no plausible excuse manufactured to justify continuous additions to petroleum stocks. Knowing the law of trade, how can any oil man give any satisfactory reason for our adding to storage, each and every day for the eleven years just passed, an average of about 124,900 bbls. of petroleum and its products?

Every executive and every individual should realize that success and prosperity are based primarily upon the prosperity of the industry itself. No individual can possibly achieve permanent success if exclusive reliance is to be placed upon individual effort. The forces marshalled against him are altogether too great. This is a time when the constructive cooperative effort of all is essential if the industry is to profit from its full possibilities during the coming year.

The general restraint upon crude production which the industry has exercised is indicative of what producers can, and will, do to meet an emergency. Stability requires that we speedily seek and find a permanent solution. We must find an answer that will dispose permanently of the age-long methods we have employed in the competitive development of single pools. The method must be one which we may rely upon to yield economy in development and operation, to obtain greater recoveries from the sands, and to provide for stability of output as related to market demands. I believe the answer is to be found in the application of some practicable form of unitization or unit operation.

(Continued on page 553)

Problems Before the A. P. I. Meeting

Serious Efforts Made To Ascertain Causes of Unsound Conditions In All Branches of Petroleum Industry, and To Offer Methods For Rationalization . . By Russell R. Palmer

Editor
Petroleum World-Oil Age

THAT oil producers in the United States and abroad may again seek to reach an international understanding on conservation is a strong probability as a result of encouragement given such a movement from several quarters at the eleventh annual convention of the American Petroleum Institute in Chicago, where 2,200 attending oil men registered.

Such a concerted effort gained impetus early in 1929, only to be thwarted when the United States Attorney General announced that the Federal Oil Conservation Board lacked the authority to sanction the proposed plan for crude oil curtailment.

Speaking before the first general session of the convention, Colonel William J. Donovan, former assistant attorney general of the United States, stated that it would be unfair to the Department of Justice and to the Attorney General to assume that by this action a year and a half ago the Government has closed the door in the face of any industry that desires to put its business on a sound economic basis.

Colonel Donovan declared that rather than lend itself to an advocacy of modifying or abandoning the theory upon which the Sherman Law is based, the industry should be certain that under existing laws it cannot carry out those measures it believes necessary to insure stability of operation.

On the first day of the convention the Royal Dutch-Shell Group, through F. Godber, one of its directors, reiterated its offer made about a year ago that it is willing to reduce its production in Venezuela proportionately with any average reduction in the United States, the rate of production in 1929 to serve as a basis. American producers were reminded that if this offer had been accepted when it was made last January, Venezuela production would already have been reduced by many million barrels for the year "and the whole oil position would, in consequence, have been materially improved."

While the board of directors of the Institute discussed the subject of an oil tariff positive action on the matter was sidestepped on the ground that the vote was insufficient to be considered a test of the opinion of the membership of the board. It is dealt with elsewhere in this issue.

Economists and experts of the Federal Government and the petroleum industry were in accord on the industry's economic position, reports of the Committee on Petroleum Economics of the Federal Oil Conservation Board and the Special Committee on the Economic Situation of the Institute receiving the attention of the leading American oil producers and refiners at an epochal meeting at which probably 90 per cent of the producing and refining capacity of the nation were represented.

If the industry is to make progress in righting its economic ills during the coming six months it was agreed that stocks of gasoline in the United States on April 1 next must not exceed 40,000,000 barrels. Briefly this means that a reduction of 8.2 per cent must be made in gasoline production and imports.

Crude oil production, it is estimated must be held to a daily average of 2,333,500 barrels, with imports totalling not over 158,700 barrels a day.

Economists are agreed that in the next six months there may be a decline in U. S. consumption of gasoline as compared to the same period a year ago. Questionnaires sent to refiners by the Institute has revealed that the contemplated program of the various units acting separately will involve running to stills during the next six months a much larger volume of crude than is necessary to meet the estimated demand, and that if runs to stills continue as contemplated by the separate units of the industry, stocks of gasoline on hand March 1, next, based on a break even demand would be 78,000,000 barrels, an amount so much in excess of the estimated requirements as to demand the attention of every refiner.

While imports of crude petroleum into the United States have decreased during the last three years, imports of gasoline and other products—mainly fuel oil—have increased. This is particularly true of the first nine months of this year due, of course, to the expansion of refinery operations near Venezuela. U. S. imports of gasoline in the first nine months of 1930 represented 3.8 per cent of the total supply in the country during that period; in September the proportion was 4 per cent. On the other hand our exports ran into a very high figure.

One point brought out by the Federal oil board's committee and one to be seriously considered by American producers is that oils imported into the United States are in general lower-cost than domestic oils. The primary cause for this difference is that foreign oil fields more largely employ the principals of unit operation with their attendant efficiencies than do American oil fields. One remedy for this condition obviously would be greater progress toward unit operation in the United States.

This subject of unit operation was, of course, one of the most important brought before the attention of the convention, and the paper by T. E. Swigart of the Shell Oil Company of California on the Engineering and Economic Aspects of Unit Operation of Oil Fields was probably the outstanding contribution on the subject. Mr. Swigart left no doubt in the minds of his convention listeners that engineering problems involved in unit operation are complex and may be difficult of solution if operators do not maintain a sympathetic attitude toward the plan, but the benefits to be derived in reduced development and production costs are so great as commend this type of operation to every thinking oil operator.

Mr. Swigart's statement that $31,500,000 could have been saved at Seminole if unit operation had been employed was one that every practical oil producer could understand. There is little doubt that unit operation would greatly lower development costs in nearly every field. The exact savings in production costs under unit operation are difficult to estimate, but they would be substantial.

Oil Development Costs In Venezuela

Approximately $500,000,000 Has Been Invested by International Oil Companies in Venezuelan Petroleum Properties. Creole Has Spent $63,-000,000 to Date . . Translated from Spanish

CARACAS, VENEZUELA

IN the November number of WORLD PETROLEUM I outlined the seven years' exploration and development work that has been carried out in Eastern Venezuela by the Creole Petroleum Corporation, a unit of the Standard Oil Company of New Jersey.

Besides their work in the State of Monagas, the Creole and its subsidiaries have also explored and drilled wells in the States of Falcon, Sucre and Zulia; at present they are drilling in the neighborhood of Barinas, capital of the State of Zamora, one of the regions of Venezuela that is most distant from the coast.

An idea of the tremendous cost involved will be appreciated when it is mentioned that the Creole Petroleum Company has invested in various works of exploration and drilling in Venezuela the substantial sum of $63,000,000; the number of wells drilled since 1921 amounts to 60, and the average cost of each, in testing regions, is estimated as at least 1,000,000 bolivars, or about $200,000.

An estimate recently published in the American press fixed the investments of all companies at the figure of $200,000,-000, a total which appears to be much lower than the actual outlay.

Investigations made in Caracas, based on data furnished by a number of oil companies operating in Venezuela, raise this computation to approximately 2,-500,000,000 bolivars, or approximately $500,000,000. There should be taken into consideration the fact that the expenses of many other enterprises which have not yet presented their corresponding reports are not included in this amount.

It is of interest to give petroleum development investments in our country of Venezuela where they have exceeded 100,000,000 bolivars, to wit:

Caribbean Pet. Co. [Royal Dutch-Shell]	Bs. 187,200,000
Colon Develop. Co. [Royal Dutch-Shell]	Bs. 126,250,000
Creole Pet. Corp. & subs.[Std. Oil of N.J.]	Bs. 305,043,089
Lago Pet. Corp. [Std. Oil of Ind.].....	Bs. 291,200,000
Pantepec Oil Co. of Venezuela.....	Bs. 111,375,019
Venezuelan Gulf Oil Co. [Gulf Oil Corp.]	Bs. 358,800,000
Venzln. Oil Concessions, Ltd.[Royal D-S]	Bs. 233,562,500

The rate of exchange may be regarded as 25 bolivars to one U. S. dollar.

In the individual expenses of each enterprise, or group of enterprises, are included all expenses relating to their work, no matter of what nature this may be.

The Shell group (Caribbean Petroleum; Venezuelan Oil Concessions; and Colon Development), has invested approximately 546,000,000 bolivars, as against around 954,000,000 bolivars invested by the principal American interests, namely, the Gulf, Creole, and Lago. In view of the heavy development expenses, it is not surprising that the Creole is increasing its capital stock from 6,000,000 to 7,000,000 shares to expand its activities. The success of Creole in Eastern Venezuela, creates a new and important field of oil production under the direction of a concern which has operated on a solid foundation, and which incorporates all the elements indispensable for production and export on a sound commercial basis.

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Venezuelan Crude-Oil Cost Investigation

THE U. S. Tariff Commission is now engaged in complying with a mandate by Congress directing the preparation of a report showing the approximate cost per barrel of crude petroleum delivered to the oil refineries of the Atlantic seaboard from oil fields of the United States, together with similar information showing the approximate average cost per barrel of crude petroleum delivered from Lake Maracaibo, Venezuela, to the same refineries.

At a public hearing on Oct. 1 two representatives of the independent producers of the United States appeared and asked the commission to focus its attention on several specific points affecting the matter. It was urged that the average cost of domestic crude oil that is to figure in the commission's report should not be limited to the cost of production at the domestic sources from which the Atlantic Coast refineries draw their supplies, but should be the average cost of producing a barrel of crude oil for the whole of the United States.

This illustration gives a better conception of one of the Lake Maracaibo oilfields than any yet published. — Courtesy, International General Electric Company.

Current Situation of the Oil Industry

There is a Middle Ground Which Will Aid in Stabilizing Matters, Meanwhile the Intrinsic Values in Good Sound Oil Companies Have Not Been Lowered . . .

By R. C. Holmes
President,
The Texas Company

THE oil industry is suffering, to some extent, from the distress in other lines of industry, but more largely from causes within its own activities.

The waste has been very great, both actual and economic.

It is roughly estimated that the waste in the producing branch of the industry, alone, in a period of a little over twenty years has been upwards of four billion dollars; calculated at approximately ten trillion cubic-feet of gas, over two billion barrels of recoverable oil, and approximately one billion dollars in unnecessary drilling facilities and other expense, which could have been avoided had business been carried on in an orderly, economical and conservative way. And, to a very large extent this waste continues, probably the greatest being in the waste of gas, which waste is now fully one-third of that being consumed.

Too Many Producing, Refining and Marketing Units

The multiplicity of facilities, particularly distributing facilities, has been and is wasteful. There are some 10,000 producing units, 270 refining units, and about 25,000 marketing units in the industry. While the evil practices that creep into marketing are not peculiar to the oil trade alone, they, nevertheless, because of this very large number of marketers, in the aggregate constitute difficulties that have a depressing effect.

The Code of Practices for Marketing Refined Petroleum Products, adopted generally by the American oil industry about a year ago has made some progress, and in average times would have met with greater success. But, with the pressure of excessive stocks, both crude and refined, and the necessity for cash on the part of some, an unusually severe competition for outlets, or volume, frequently regardless of costs and returns, has prevailed. Strangely enough, it is usually those who pursue unethical and unsound merchandising policies that are the ones least able to withstand the consequences of the demoralization that results.

Import Duties Not a Cure

The large increase in imports has also had its effect, and while I think it is not generally considered that import duties on petroleum products are a cure for the depression in the industry, it is certainly water on the wheel of the millers who are trying to grind out the mill.

Russia is a factor. She was producing oil before America. In 1901 she produced 85 million barrels of crude oil —about 15 million barrels more than the United States. In 1915, 68 million, and after the counter-revolutions in 1920 and 1921, at which time much of their field and other equipment was destroyed, they were down around 25 million. The equipment and methods, however, were more or less antiquated and since then modern facilities have been built up and modern methods generally prevail in their oil industry.

They have increased their refining activities, including two new refineries on the Black Sea, where they formerly had none; with large, new pipe lines leading from the producing fields at Baku and Grosny, and their crude production will approximate 128 million barrels this year. They have established themselves in many of the European and some other markets, generally with low prices and, as stated, they are a factor in the present situation.

Russia's Future Consumption

If their industrial and economic policies succeed and they are enabled to provide themselves with the benefits they expect, then they, a nation which has a population considerably in excess of that of the United States, will consume a very large quantity of their own petroleum products. Whether they succeed or not, in all probability the Russian nation will continue to be an exporter of petroleum products in quantity.

The principal problem of the industry, however, today, lies largely in the difficulties of adjusting and reconciling itself to the actual conditions of conservation. To some extent the cause is in a lack of confidence that we are actually embarked upon a permanent and definite policy of conservation, which a few seem to think inconsistent in that it should come into

MR. R. C. HOLMES
President, The Texas Company
Blank & Stoller, specially posed for World Petroleum

fullest effect when oil has become temporarily so plentiful.

Great Drop in Gasoline Price

In the aggregate, these influences, with others, have brought about an average gasoline price in the United States, exclusive of State taxes, about 5½c per gallon below the average for the years 1921 to 1928, inclusive; and crude prices which are lower than any yearly average for the past twelve years, except 1928.

It is probably fortunate for the Treasury Department that the American Petroleum Industry cannot make a consolidated income tax return for 1930, although this in itself need not be alarming as net earnings have averaged only a little over 3% for the period of the last ten years on the total investment in the industry. While some units are paying for the privilege of working, others are still making a living wage. And compared with other industries, the volume of business is good.

World production of crude oil has increased 285% since 1913, or from 385,345,000 bbl. to 1,484,451,000 bbl. in 1929, and the world's gasoline business from over 48,000,000 bbl. in 1913 to 488,400,000 bbl. in 1929.

America's gasoline business has become the major part, or backbone, of the industry. The 1930 business, including exports, will probably be about 5% above 1929, which, compared with the volume of business in other commodities, is excellent. And people will continue to use gasoline. They may not buy automobiles, and they may wear out all of the old tires, or run on the rims, but they have spread their activities too far to walk.

About 85% of all the installed machinery horsepower, that is, of prime movers, including steam and water power generating machinery, is fueled by gasoline. Approximately 80% of this is in automobiles, trucks and buses, the balance in tractors, stationary machinery, water craft and airplanes. This machinery is not going to do with any less gasoline per mile or per horsepower than in the past.

Conditions with Natural Gas

The natural gas production and distribution, a very important branch of the industry, is experiencing a very rapid development. Consumption, since 1913, including some 242 million cubic-feet piped into Canada and Mexico, has increased about 330% in 1929, to, in round numbers, 1 trillion, 918 billion cubic-feet; and it is estimated that in 1930 it will exceed this figure by some 20%. Major natural gas-pipe line projects now under construction total over 3,000 miles of main trunk lines having a capacity capable of eventually increasing the 1930 volume by about 10%, mostly in this middle west territory.

Government's Conservation Policy

There can be no reasonable doubt that conservation is now a well established policy of the Federal Government and of the oil producing States and, being generally recognized as unquestionably in the interests of all concerned, it will inevitably go forward. It has in it the opportunity for determined and defined underground reserves, and an insurance that will relieve the industry of the burden of large above-ground stocks; and with it all, the opportunity for economies that are so much desired.

We are, therefore, today, and I have no doubt for some time to come, working under basically new conditions.

Conservation of oil is not new. Over 20 years ago laws had been enacted in Indiana, Louisiana, Oklahoma and Arkansas, designed to prevent the waste of oil and gas. At the same time the Federal authorities, as well, realizing that petroleum is an indispensable, irreplaceable resource that will eventually be exhausted, were gradually more and more convinced of the importance and necessity of definite and, to whatever extent possible, concerted conservation activity.

But, as can be readily seen, conservation in periods when there was a shortage was difficult because of the insistent demands for the product, and also because of the reluctance, and in many instances the refusal, of operators to cooperate because of inadequacy of the law. It seems particularly fortunate that when the activity is now finally well under way, we find ourselves in a situation where the industry can well afford to submit to the strictest possible observance.

Petroleum Business Expanding

The rapidly increasing volume of the business, with the effects of the estimates from time to time, had greatly accelerated the activities in the exploration and development of possible productive areas, and because of the highly competitive situation applying in practically all producing fields and the established procedure in such development, there has resulted a situation where the potential production of crude oil in the United States is fully double the actual production. And the foreign situation as a whole, excepting Russia, is practically a parallel one.

Fortunately, while any plan of activity in this country may not coincide, or correlate accurately or equitably with foreign operations, because of the fact that American and foreign interests are carrying on operations in the same countries and in many respects paralleling, there should be no very serious difficulty in practical coordination so far as results are concerned.

Conditions Not Necessarily Discouraging

These are merely my observations of conditions and in some respects characteristic of other industries and are not necessarily discouraging ones.

There is much of a corrective character that can be accomplished within the industry to improve conditions, and the disposition to cooperate in every proper and helpful activity was never better. It is possible that additional supporting legislation may be necessary in connection with the conservation plan in some instances. The recent decisions in Oklahoma, upholding the Oklahoma Statutes, have been very encouraging.

A need is felt for either a more liberal interpretation of some of the Anti-Trust Laws governing trade, or modifications. The Anti-Trust Laws served a good purpose in correcting one extreme, but have brought about another.

Fuller Cooperation Essential

What, of course, is most desired by all in legitimate business is stability rather than waves of prosperity and depression, and to this end is needed fuller cooperation in industry and such coordination with Government as can be helpful in accomplishing it.

It is quite natural, but nevertheless unfortunate, that many are reluctant to seek corrective legislation for fear that it will involve a certain amount of Government supervision, which, however, may or may not be objectionable. Surely there is a middle-ground which will aid in stabilizing matters. Every Government, regardless of form, is called upon in times of extreme distress to share a part of the burdens and is probably under obligations at other times to guard against extravagances and extremes.

The Oil Family, however, is some times looked upon with suspicion and occasionally kicked in the ribs, probably because of its rough pioneer grandfathers and its black sheep. It is, nevertheless, worthy of support and consideration.

In the meantime, regardless of stock market quotations, the intrinsic values in good, sound oil companies have not been lowered.

Wasting the Benefits of Conservation

Interesting Comments by Executives of Some of the Leading American Oil Companies On Russell Palmer's Outstanding Article On To-day's Situation In the Petroleum Industry.

NATION wide interest has been aroused by Russell Palmer's vigorous article dealing with conditions in the gasoline marketing branch of the petroleum industry, published in WORLD PETROLEUM for November. Quotations from the article were published by the daily press throughout the United States, as well as abroad. Many communications discussing this article have been received from officers of important oil companies. While space does not permit publication of all the letters, some of the interesting comments are reproduced in part herewith.

The first letter to be reproduced is from W. T. Holliday, president of the Standard Oil Company of Ohio. Mr. Holliday's interest in the situation is so intense that he has gone to great length to expound his views, and to agree or disagree, as the case may be with the statement of Russell Palmer. His letter is as follows:

To the Editor of World Petroleum.

I have read the article by Russell Palmer, entitled "Wasting the Benefits of Conservation." The article is very interesting. His handling of the matter of an oil tariff is excellently done and I entirely agree with him. I also agree with his criticism of the excessive margins which have been maintained rather generally, both between the service station price and the tank wagon price and between the tank wagon price and the tank car price.

I do not agree however with Mr. Palmer's statement that "responsibility for present conditions rests squarely on the marketing end of the business." I believe that is putting the cart before the horse. The present deplorable conditions in the marketing end of the business were caused by over-production of crude oil, over-production of refining capacity, and over-production of gasoline. Unless those three factors are improved there can be no fundamental improvement in the marketing end of the business.

Pressure of crude caused the building of refineries when refineries were not needed. Conversion of batch still refineries into continuous refineries further augmented the increase in refining capacity. These refineries have been run according to old habits of operating full tilt all year, and accumulating large inventories in the winter. This has been done by companies through the pressure of excess crude oil, which they felt they must force to market, and through the pressure of the desire to operate refineries in order to preserve the investment therein.

The result has been constantly increasing inventories of gasoline. The article in question indicates that the refineries have done their share in that there have been substantial reductions in gasoline inventories in this year 1930. In spite of such reduction gasoline inventories are *too large* right now. They were so large in the early part of this year that they could not be sufficiently reduced during the year even with the so-called six-day week.

I do not believe that there is anything that the marketing end of the business can do to cure the fundamental causes of the present deplorable situation. So long as refineries insist upon piling up excessive inventories distress gasoline will be forced upon the market at distress prices. Distress gasoline is coming into Ohio right now at prices netting back to the refineries below the cost of crude oil. The excessive inventories of gasoline have been the *immediate* cause of lack of profits in the business this year, and the conditions which your article describes are but symptoms or results of the disease.

I remember very vividly when this present situation began to develop. It began with the opening up of the Los Angeles oil fields. A gusher field threatened to shut down the small wells of the country which had been the backbone of production. Posted crude oil prices were not reduced in reflection of the price of California crude oil or the price of gasoline. The purchase of crude oil was prorated and we had bootleg crude oil for the first time. The refining and marketing companies buying mid-continent crude at posted prices had to complete with distress gasoline coming from California and the mid-continent field at tank car prices below their cost of manufacture. That situation has been repeating itself from time to time with the bringing in of new flush fields.

It was this situation, I believe, which brought about the over-production of distribution facilities because wide margins between tankcar price of distress gasoline and the service station price attracted so many newcomers. In addition to this there was the urge of companies, having a pressure of crude oil, to build refineries and make finished products in such a market of wide margins.

It has not been merely small concerns that have over produced. Some of the very largest concerns have increased refining capacity to take care of their increased crude production, and then have attempted to force their finished products upon the market through an increased number of distribution outlets and through price cutting of one sort or another. One of these companies boasts that it is not selling gasoline but crude oil.

It seems to me that the logic of this thing is quite clear, to wit, that there can be no cure except first by curtailing production to prospective requirements. As long as the industry as a whole continues to pile up inventories of gasoline the chaotic condition in the marketing end of the business will continue.

Much has been done in the producing end of the business. The most fruitful place for reform today, I believe, is in the refining end of the business. It is of little use to curtail production if the refiners continue to over produce gasoline. Much of this over production, I believe, is due merely to habit. In the old days it was necessary for refineries to accumulate inventories in the winter to take care of the peak demand in the summer. Today the refining capacity of the United States is more than sufficient to supply the peak demand of summer.

It is not necessary for a modern refinery today to run to capacity in order to operate economically. With modern continuous process a refinery can operate according to seasonal requirements and still be efficient. If refineries would only refine from month to month the quantities of gasoline which they had reasonable ground to believe they could sell, the symptoms in the marketing end of the business which Mr. Palmer's article describes would disappear. The trouble is that some refineries have no reasonable expectancy of sales, and they will not stop refining because it is not natural for people so to do unless financial necessity compels them.

After all, the essential difficulty is that oil men are human beings and react instinctively to economic forces as human beings ordinarily do. To prevent such reaction requires rationalization and intelligent effort on the part of the industry as a whole, and it is very difficult to effect that without such cooperation as is prohibited by law, and the further trouble is, that even if all of the present industry

became rationalized, new people would be rushing in tomorrow to cash in on the situation.

If the oil industry was one great corporation the marketing end of the business would control both the production of crude oil and of gasoline, and in that event properly would be subject to censure for any bad results. Under present conditions, the marketing end of the business is helpless and at the mercy of the producers and the refiners.

W. T. HOLLIDAY
President,
Standard Oil Company,
Cleveland, Ohio.
November 5, 1930.

The president of one of the larger independent oil companies writes WORLD PETROLEUM as follows:

To the Editor of World Petroleum.

The November issue of WORLD PETROLEUM is full of interesting articles. I have read Russell Palmer's article, "Wasting the Benefits of Conservation," appearing therein, which is interesting and to the point.

I am in accord with the ideas all the way through except the last paragraph. If the European oil leaders are "baffled" about the situation, it is merely that they cannot understand why the American industry with its great number of units cannot be traded with in the same manner as a very small group of foreign interests.

The president of one of the important mid-continent refining and marketing companies writes as follows:

To the Editor of World Petroleum.

I have read with interest the article, "Wasting the Benefits of Conservation" by Russell Palmer. I do not agree with the statement that "the industry as a whole has not improved this year." On the contrary, I believe it has made decided improvement. As suggested in the article, the conservation idea met with severe knocks and disappointments in its early career, all of which have substantially been overcome so that the curtailment of production seems to be a permanent policy.

Likewise, I do not agree that the producers have been "without compensating benefits." For the first time in our career, we have been receiving fairly good prices for crude in spite of the tremendous potential production. The recent cuts were forced on the larger companies by the bootleggers.

I am in full accord with Mr. Palmer's position on the tariff.

The refining division of the industry is to blame for the present deplorable conditions. Sufficient improvement has been made to justify me in believing that the program to be submitted at the A. P. I. meeting next week will be adopted generally by the companies. We are, of course, severely handicapped because of the necessity of attempting the program through individual effort rather than by concerted effort, such as we have in the producing business. The meeting which we propose to hold next Monday night will, in my opinion, be the most important of all the week's efforts. I am hopeful that the press will point out very clearly that while the meeting will appear to be for the purpose of getting concerted action, it is nevertheless an effort on the individual companies without any agreement.

The marketing division is deplorable. I believe, however, that the recent action by one or more of the large companies in reducing the retail price without a change in the wholesale price is a step in the right direction. Commercial discounts and rebates, on account of the wide margin, caused the terrible conditions. I believe the spread will be reduced so that unfair practices will be practically eliminated. In order to bring this about, it will probably be necessary to operate the marketing end of our business on a basis which cannot yield a profit. The problem, however, is so full of difficulties that I am not certain at this time as to just what will be the outcome.

My close contact with the industry leads me to believe that we are entering a new era in the petroleum industry, and that the year 1931 will be a profitable one for integrated companies.
November 7, 1930.

Here is what the vice-president of an oil company, whose operations are international, says:

To the Editor of World Petroleum.

I recently received the November issue of WORLD PETROLEUM and read the article, "Wasting the Benefits of Conservation," by Mr. Russell Palmer. I think Mr. Palmer has written a very splendid article and his conclusions are, in my opinion, absolutely sound and it is to be hoped his warning will bear fruit.
November 8, 1930.

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World-Wide Curtailment Collaboration and Better Crude Prices

By F. Godber
Director, Royal Dutch-Shell Group

A GOOD deal has been said recently about the difficulties of the oil industry, and it becomes apparent that a great many of those interested are throwing up their hands in despair as a result of their belief that the ills of the industry are almost too serious to cure. Ills exist in abundance but undoubtedly a remedy can be found and is available if the industry would only meet its problems along broad lines.

Recently we have witnessed a collapse of the price structure of the domestic markets east of the Rockies, the abandonment of export prices and anything which would assist producers, upon whose shoulders the industry really rests, in securing a proper return for their energies in exploring for new fields and developing those already discovered. So far producers have borne their full share of the sacrifices necessary to rationalize the industry and it is unfortunate that circumstances have so developed that their reward for these sacrifices has been reduced returns for such crude as they are able to produce. It would seem that a higher scale of prices for crude oil can but result in improved conditions generally. The industry is fraught with difficulties because of uncertainty caused by frequent and wide fluctuations in the price structure. No industry can progress unless the price of the commodity which it produces is stabilized along reasonably steady lines. Today both producers, refiners and marketers are operating at a loss and no great industry can continue long upon this basis. The law of supply and demand might be allowed to function and conservation abandoned; but in order to do so one of the greatest industries in this country and in the world would be completely wrecked. For this reason one must favor an increase in crude oil prices, believing that so long as crude is produced only within the limits of the demand, and the producers have indicated their willingness to keep their operations within these limits, that there is every reason why crude prices should be improved and the producer allowed to earn a fair return on his investment.

Apparently for some reason or other the industry cannot or will not find common ground upon which to tackle their problems. One has one solution and another another, when really the solution is clear. Crude prices were cut recently because some producers could not find an outlet for their production and were selling it substantially below the then posted price. By so doing they did not increase the demand for crude

(Continued on page 561)

Self Discipline in the Oil Industry

Huge Gushers Do Not Form Part of Sound Operating Procedure. Investment Required by Tankage and Pipeline Facilities Are Out of Line With Returns.

THE best thing that ever happened to many people has been the discovery that they had heart trouble. Forced to live a regular and carefully ordered life, they not only avoided the early demise indicated, but have outlived more rugged beings who saw no need to take health precautions. Many a misfortune has been turned by courage and good sense into a contributing factor to success.

The petroleum industry will take a survey of its general health one of these days and find to its surprise that what it has been regarding as punishment is in fact a reward. We have grown so accustomed to carrying on our shoulders the little Old Man of the Sea, Overproduction, that we fail to realize that he has been guiding our steps into the path to returning prosperity. Perhaps the time has come to drop the words "curtailment" and "prorating" from daily discussions of the crude oil producing business. Compelled by overflowing storage and oversupplied markets to reduce operations, the oil producer in many localities has abandoned wasteful, unremunerative practices in favor of sound operating procedure.

There have been, almost daily, stories spread by private and press reports of the bringing in of 50,000-bbl. wells, with potential production of 3,000,000 bbls. In sound operating procedure, such as the industry is now beginning to achieve, there is no such thing as a 50,000-bbl. well. The investment required to care for flush production of wells of that size, involving the building of costly tankage and pipe line facilities of a probably short life, is out of line with the returns to be expected.

If every restriction, both voluntary and those imposed by force of the state's power to control, were removed from the oil business tomorrow, it is a fair question if operators would go back to practices which they came by temporarily under pressure of necessity. In other words, what was taken as medicine has been discovered to be substantial food.

There is available an informative comparison of the producer's experience in two prolific fields, namely, the Yates County pool in Texas and the Oklahoma City field in Oklahoma, both now much in the public eye. The significant fact is the low cost of production per well made possible under real proration and controlled drilling. The typical producer may be left cold by the arguments for conservation, but he becomes quickly interested when some one shows him a method of lowering his costs.

When the Oil Conservation Board, the State Commissions of California, Oklahoma and Texas, the American Petroleum Institute and other agencies began to urge the imposition of artificial restraints on the producer, they were meeting an emergency. The United States was overproducing on such a scale that prices were forced down to a point where the oil was going into uneconomic uses. That meant waste of an irreplaceable resource. When the emergency has passed it will be found that the oil industry, government conservation authorities, both State and Federal, and the public are educated to a state of mind which will insist that this great national resource be produced and marketed in an orderly, scientific and efficient way. This will mean that excessive drilling, unnecessary number of wells, waste in producing, with attendant loss of gas and oil and the waste in handling and marketing that forces oil into uneconomic usage, will all be eliminated. Unquestionably, this great resource is of such intrinsic value to the nation that efficiency in production and distribution is going to be demanded.

When we look into the future as to how this can best be fostered, we can visualize no finer example than the operation of the Yates pool. Every new oil field should go into production and become a part of the nation's supply operating in an orderly, scientific controlled program so as to eliminate waste. The logical way to bring this about is through unitization of oil pools. Perhaps existing laws make this a visionary plan, but ideas and practices may be unitized even if properties cannot be pooled.

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Unit Operation Production Solution

(Continued from page 546)

Critics may analyze the petroleum situation to their heart's content, and find what they may seek; but, as I see it, these three factors in the oil situation are important for oil company ownership and management to note and to remember:

1. The petroleum industry at this moment faces a condition that it has faced only once before in its history, namely, the almost certain prospect that during the coming six months' period there will be a very small, if indeed any, percentage increase in the demand for its principal money product, gasoline.

2. The excess of all liquid petroleum products at any given time is the difference between the aggregate of all stocks actually on hand and the aggregate working stocks necessary to meet current demand. The same definition will apply to stocks of crude or of any particular refined product. It, therefore, follows that the economic lesson is to dispose of, or to reduce, the excess until a balance is reached.

3. The necessity for quickening effort to find as promptly as possible the effective and permanent solution of the industry's major problem of how to prevent recurrent periods of overproduction of crude oil, which remains the root of the evil.

Conservation, or pro-ration, under the present plan does increase the cost of production, and it will continue to increase until competitive operations are displaced by unit operations. Present prices for crude petroleum and its products are not remunerative.

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Russia's Oil in Spain

IMPORTS of Soviet petroleum products into Spain during 1929 increased by 493,222 bbl. over 1928, whereas America's sales to Spain only increased 164,464 bbl. Spain imports about 3,500,000 bbl. annually. Russia's sales in 1930-31, however, will show a decided drop.

Wildcatting for Crude in Iraq

Experiences of an American Drilling For Oil in the Mid-East at 122 Degrees Fahrenheit in the Shade, Bringing In a 96,000 Bbl. Gusher at 1521 Feet . . . By K. D. Pardee

Former Field Superintendent, Babu Gurgur Structure, Iraq.

ONE of the first two Americans engaged by the Iraq Petroleum Company to test the potential oil fields of Iraq, which have lately regained a place in the limelight of petroleum and international politics, was T. R. Coveney, a drill pusher. The writer, field superintendent, was the other pioneer, and was followed by E. P. Wieman, drilling superintendent. Mr. Wieman was one of the founders of Wieman, Kemmerer and Wright, Hollydale, California, and formerly with the Union Oil Company of California. Mr. Coveney and the writer departed from New York on the S.S. BERENGARIA, November 3, 1926. After spending a few days in London and Paris, we boarded a French boat, the CHAMPOLLION, at Marseilles and traveled down the Mediterranean Sea to Alexandria, Egypt, where we stopped for two days. We then sailed to Beriut, Syria, disembarked and caught the Nairn Overland Transport from Beriut to Bagdad.

We left Beriut, in a Cadillac automobile, on the 25th day of November, hoping to arrive in the usual time of thirty-six hours at Bagdad, which is 700 miles inland. The route usually followed from Beriut to Damascus, via Rutbah Wells—a fort on the Syria-Iraq border,—to Bagdad, was closed to all transportation on account of disturbances between the Arabs and the French at Damascus. Consequently we had to detour approximately 250 miles through Homs where we stopped the first night.

Mid-east and mid-west meet. J. C. Fisher, American driller, and two Arab sentries.

On the morning of the 25th we left Homs at daybreak, eleven cars in the convoy, also seven English women, which didn't help matters. It started to rain, but we traveled approximately 100 miles, when every car in the convoy was stuck two or three times in the mud At night the eleven cars would stop in a circle with their lights shining on the desert so as to detect any caravan raiders who might approach the convoy

After seven days of continuous rains during which time we were all employed in digging the Cadillacs out of the mud, especially the car which carried the mail, as no passenger cars are permitted to pass the mail car on the desert, we arrived safely in Bagdad. After taking one look at Bagdad and wading across the streets to the American Consulate, we had a desire to get back to the desert. The odor of Bagdad was very unpleasant at that time and the streets, especially New Street, which is the main thoroughfare of Bagdad and which is now paved and modern, were in a deplorable condition. One needed rubber boots to get from one side of the street to the other. We stopped one night in Bagdad and caught the "Twentieth Century Limited of Asia" the next night at 9 p. m. and departed for our future homes in the oil fields, 125 miles north of Bagdad, arriving there at eleven o'clock the next morning.

The writer and Mr. Coveney were the first two Americans employed by the Iraq Petroleum Company. Consequently, upon our arrival we found that we had

Most of Iraq's wells have been 100,000 bbl. gushers.

no accommodations whatsoever other than a tent to live in. John Rogers, the company's engineer, at that time was building bridges, roads, laying water lines and oil lines to what was to be the first oil well drilled in Iraq. He was a very hospitable fellow, and left his work for the time being to get us situated in our new home. We tried our very best to live off the land, which grows everything one should enjoy, especially mutton. But this we gave up after a few weeks of trying to digest native cooking, and started to live out of pork and bean cans in the good old American way.

At the time of our arrival in Iraq, as mentioned above, the only operations were the building of roads, pipe lines, etc., which were all done by native labor under the supervision of Mr. Rogers, and for which he deserves real credit. The building of the roads through the hills and mountains was an engineering feat and was all done by hand with coolie labor. The first road to be constructed was approximately thirty miles in length, and through the low lands was graveled, the gravel being transported several

miles by camel and donkey power.

During the latter part of December and the fore part of January, 1927, the drilling equipment, of which the major part came from the U. S. A., and the derricks from Germany, started arriving at Basa on the Gulf of Persia. From there it was transported by rail to Bagdad, thence to Sulamain Beg where our central stores were to be located. From there it was distributed by trucks, tractors, camels and donkeys to the various field locations.

In the beginning the wells were so widely separated that it was necessary to erect a camp, machine shop, etc., at each location. From the beginning of May until the end of September the temperature is from 120 degrees to 122 degrees in the shade (no shade). Fortunately each machine shop was equipped with an ice plant; consequently we had cold drinks throughout the summer, and these were mostly whiskeys and sodas, as the U. S. prohibition did not extend to Iraq. From the fifteenth of May to the fifteenth of June the locusts were so thick that one had to wear "armor" when out in the open or while traveling in a car. It was the only time of the season that we were able to live off the land, and this lasted until the honey was depleted.

The first group of American drillers arrived in Bagdad on March 18, 1927. By this time we had erected mud huts for them to live in with all the luxuries of home. The drillers immediately set forth and made preparations to start drilling Palkhanah No. 1. The derrick had previously been erected under English supervision. After two days in camp, the native sentries, of which there were eight or nine patroling the camp, staged a sham battle for the benefit of their new American friends, claiming that robbers had made their way down out of the hills and attempted to rob them. This was a new experience for most of the Americans and started a movement whereby each and everyone tried to provide some means of protecting himself from the bandits, such as crawling into a joint of casing or trying to dig under his bed at the sound of the first shot. The sentries continuously put on this native exhibition for us, and after a time everyone became used to it and more or less enjoyed it.

On the fifth day of April, King Feisal, who was with Lawrence in his ventures in Arabia during the war, accepted the invitation to start the operations in Iraq by opening the throttle after an elaborate ceremony at Palkhanah No. 1. An airplane photograph of this event was reproduced in WORLD PETROLEUM for November. The writer has been told that it is more or less customary for the Mohammedans when undertaking a venture of this sort to first sacrifice a sheep to insure the success of the project. However, this was not done.

The Arab drilling crew operated under American and British supervision.

After drilling to a depth of 2,125 feet the hole was lost without reaching the objective, which was expected at approximately 3,500 feet. The latest type of rotary equipment was used in our operations, but due to the fact that the formations stood in a vertical position, we experienced great difficulty in completing the first few wells. In the beginning fishtail and disk bits were used to a depth of approximately 1,200 feet, where anhydrite was encountered, with the showings of gas, oil and water. The anhydrite was drilled with rock bits, and after drilling from 300 feet to 400 feet deeper, enough gas and water was encountered to make the drilling very hazardous. At times when the drill pipe was taken from the hole there would be a movement of the anhydrite. This necessitated re-drilling from the 1,200 foot level to where the hole was originally bottomed. It took several weeks to re-drill the hole, and the slippage occurred as many as five times in one well.

The first American oil men in Iraq. Left, the author; right, T. R. Coveney.

It is the writer's understanding that there never has been a well brought in as a producer in the Palkhanah area, as I also understand is the case in several other areas in that country. Also, it has been reported that the Iraq Petroleum Company, due to the time limit given them on their concession, have evacuated or stopped operations on all the areas with the exception of that known as Babu Gurgur, which is near the city of Kirkuk. The potential oil reserves are from one-fifth to one-sixth of the entire known oil reserves of Iraq, which is around six billion barrels.

On October 13, 1927, the well which was then being drilled and known as Babu Gurgur No. 1 came in producing almost 100,000 barrels a day from a total depth of 1,521 feet, through a ten inch casing. This well flowed wild for eight days, being shut in on the morning of October 22, 1927. The result is that the Iraq Petroleum Company has withdrawn its equipment from all other areas and centered attention on the Babu Gurgur structure. There have been to date 16 wells completed on this structure, each one equaling in estimated production the original well, Babu Gurgur No. 1. The wells are distributed over a territory of approximately thirty miles in length and are being completed in approximately sixty days. As each well came in it was tested through beans ranging from ¼ in. to 2 in. diameter. One week to ten

days was required for tests through the various beans. Estimates were arrived at by comparison with Babu Gurgur No. 1.

On the Babu Gurgur structure, north of Babu Gurgur No. 1, two wells, each with an estimated production of 110,000 bbl. have been brought in since the writer left Iraq. Babu Gurgur No. 1 was drilled to 1,521 feet, and not brought in at 1,350 feet as mentioned recently.

I might add here that considerable credit is due the American drillers who have been employed to insure the success of the drilling in Iraq. When drilling they work three tours of eight hours each with two Americans and eight natives on each tour. The salary of the natives varies from thirty-five cents to one dollar per day according to the position he holds while on tour. The men working on the floor earn thirty-five cents, and the men who work on the derrick earn from seventy-five cents to one dollar per day. After one year's experience on a rotary or cable tool well the natives become very efficient in their work.

Previous to the withdrawal of the equipment from other areas the company drilled two wells in the Mosul area about fifty miles from the city of Mosul and on the Tigris River. These wells were completed at a depth from 1,500 feet to 1,700 feet, and produced approximately 15,000 to 20,000 barrels each of very heavy asphalt base crude. The wells were drilled in this area with standard tools under great difficulty. The Babu Gurgur crude, which has a high sulphur content, is 36 gravity oil.

The wells when completed are being shut in awaiting pipe line facilities which will take the oil to the Mediterranean Sea. The Y line, which has been surveyed on several different occasions, will cross Iraq into Palestine with a terminal at Haifa, and through Syria to Tripoli, where the French will have a terminal. H. S. Austin and H. M. Stevenson have sailed from the U. S. A. to take charge of the construction work. Surveying was a very tedious task, due to the fact that the instruments could not be used during the summer months on account of the extreme heat. Hence all surveying had to be done in the winter time. No doubt one of the branches of this line will be paralleled by a railroad and telegraph system, which should give it adequate protection. The engineers who surveyed the right of way for this dual line deserve a great deal of credit. The country that they had to penetrate for the first two hundred or three hundred miles was nothing but sand, at which time their transport consisted of Dodge trucks. There being no water on the desert other than at Rutbah Wells, their situation at times was very critical; especially when the transport went for water and provisions, as it would be days before it would return. Consequently water and provisions on hand while the transport was gone would have to be rationed out. At such times the native help became very dangerous, and it took exceedingly good management on the part of the engineers to keep them quiet.

After crossing the sands of Iraq the survey took the engineers through asphalt beds and hills, which were not penetratable by motor car. Consequently the transport which they had previously used was changed and camels were adopted. This was over an area of approximately one hundred miles, where they again picked up their motor transport and carried on to the Mediterranean Sea. However, this survey has been made twice, and final steps for laying the lines are being taken.

The German Geophysical Party, which started their operations in Iraq for the Turkish Petroleum Company in the latter part of 1928, rendered the company some very valuable information.

By the end of 1929 the Iraq Petroleum Company had drilled an aggregate of 76,175 feet, or more than double the minimum requirements of the 1925 concession. This does not include the drilling by the Khanaquin Oil Company—a subsidiary of the Anglo-Persian Co. controlling a 23¾ per cent interest in the Iraq Petroleum Company.

While this proposal appears to be practically decided so far as the Iraq Petroleum Company is concerned, at the time of writing it has not been submitted to the Iraq Government for approval, so is not official. The FINANCIAL TIMES of London surrounds the whole project with an atmosphere of mystery, following exhaustive inquiries by its staff in government and commercial circles.

Sir John Cadman, chairman of both the Iraq Petroleum and Anglo-Persian oil companies had no information to give and no comment to make to the FINANCIAL TIMES' representative or to WORLD PETROLEUM.

Sir Henri Deterding, head of the Royal Dutch-Shell group, who is closely interested in the Iraq Petroleum Company, stated that the pipe line question is a matter entirely for the Iraq Petroleum Company, and one in which he could not interfere.

The Secretary at the Iraq Legation in London inferred that nothing is known at the Legation of the present position, or of any agreement having been signed.

At the British Colonial office it was pointed out that the British Government, not being a contracting party, is not aware of what takes place. The Government, it was added, naturally has its own sources of information, and keeps itself as fully informed as possible; but so far has no information of any agreement having been signed. *But from every point of view it would prefer the pipe line to run to Haifa.*

This is of considerable interest, as the British Colonial Department has decided to spend $275,000 from its Development Fund towards the cost of the preliminary work of the Bagdad-Haifa railroad, while some $15,000,000 is being laid out on the port of Haifa.

Sir Edward Mountain, chairman of the British Oil Development Company, it is rumored has already obtained substantial concessions in Iraq. This company, as previously stated in WORLD PETROLEUM, has loomed on the horizon as a strong competitor of the Iraq Petroleum Company, was also interviewed. Sir Edward Mountain stated that the oil fields of Iraq are among the richest in the world and of great importance from British viewpoint. "I have always understood," continued Sir Edward, "that the British Government holds strong views that the oil should be delivered at a British controlled point. The reported decision to build the pipe line to Tripoli affects my company in no way at all."

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More On Iraq Pipe Line Situation

WHILE comparatively little regarding the Iraq pipe line problem has recently appeared in the American daily press, columns are being given to the subject in the British newspapers, as it fairly teems with both international politics and "commercialisms." In the November issue of WORLD PETROLEUM it was intimated on page 476 that two pipe lines would be constructed, one through Syria to Tripoli and the other through Palestine to Haifa, thus effecting an arrangement satisfactory to the French as well as to the British, the French

Recovery and Fractionation of Gasoline

Refinery Recovery Systems With Allusions to Field Practice, and the Importance of Thorough Preliminary Surveys by Experts to Produce Maximum Profit. ***By G. M. Jackson***

President, Jackson Engineering Corporation, Tulsa, Okla., U. S. A.

WITH many refineries today marketing gasoline in bulk at prices below the cost of production the problems of vapor losses can no longer be treated with more or less callousness. They should be given the most careful engineering study. In his recent paper before the Tulsa Exposition Meeting of the A. S. M. E., G. M. Jackson demonstrates that the installation of a system of maximum profitability cannot be expected without a thorough preliminary survey by a competent and widely experienced authority in close collaboration with the refinery management. All oil men interested in refinery practice will find much of value in this discussion, which, while technical, is expressed with such clarity that those not deeply familiar with refinery engineering can easily follow it.

IN recent years many refiners have been callous, in varying degrees, about vapor losses. Many refiners have installed systems to recover rich gases from tanks, look boxes, etc., without giving thought to the possible prevention of the formation of these vapors at the source. Some have recovered these rich vapors and neglected the relatively leaner gases from cracking units. Very few refiners have made a careful, balanced survey with a view to preventing vapor loss.

During the last few years much progress has been made in the rapid and accurate quantitative analysis of gasoline vapors and so-called dry gases. It is now possible to predict with certainty the savings which can be made by changes in handling methods, in fractionation of pressure distillate, or in proper treatment of the gases. Calculation methods have progressed until now it is entirely feasible to calculate from preliminary analyses complete material balances for different methods of operation, which show the quantities of the various constituents which can be recovered and which make possible the accurate calculation of the cost of recovery. Equipment can now be accurately selected, the calculations being entirely rational and based on the analysis obtained in the preliminary survey.

Studying Gas from Each Source

Before attempting to develop the recovery process, the refiner should make a careful study, not only of the quantity of gas from each source, but also its cause and the reason for its gasoline content. Several refineries are now making substantial economies by taking cracked gasoline directly from the cracking-unit accumulators to debutanizing units, which remove enough light fractions to prevent loss in treating, rerunning, or other handling of the remainder. The light fractions distilled off in this manner rarely require any further treatment which cannot be successfully accomplished under pressure with inappreciable loss. The advisability of making such an installation should be definitely decided before proceeding with the recovery process, as the composition, quantity, and available pressure of both the uncondensed gases and liquid gasoline taken overhead from such units should have great influence on the design of the recovery plant and final stabilizer.

Having the quantities, compositions, and pressures of all available gas supplies definitely established, the refiner must next consider the utilization of gasoline constituents before proceeding with the recovery process. In the majority of cases, either with or without making minor adjustments in the refinery processes, it is possible and economical to utilize all of the butane which can be recovered from the gas at a cost less than the cost of finished gasoline. This question is of the utmost importance in the determination of the recovery process, as the cost of the plant increases rapidly with increase in the percentage of butane extraction. The propane should also be given serious consideration, as there is a rising available market for a liquid propane. Large quantities of propane are frequently available and can be recovered simultaneously with the gasoline constituents. The quantity of propane which can be marketed and its value in the refinery should therefore be carefully predetermined.

Main Factors to Be Considered

With the two general subjects of debutanization and the utilization of recoverable products satisfactorily dealt with, the refiner can now proceed to gather the following facts more obviously connected with the plant design:

Location of gas sources.

Quantity, pressure, and composition of gas from each source.

Value of exhaust steam, high-pressure steam, cooling water, residue gas, electric power.

Temperature of cooling water, pressure of exhaust steam and high-pressure steam, requisite pressure of residue gas.

Value and characteristics of various absorption oils.

Ground space available.

Corrosive properties of gas and cooling water.

Effect of compression on corrosive properties of gas.

Unusual material specifications which might affect equipment costs.

Existing equipment which might be utilized to advantage in the new system.

Interest and depreciation rates to be used in determining annual operating cost.

Wage rates of operating personnel.

Administrative burden chargeable against gasoline plant.

Prospects of refinery expansion which may require extension of recovery system.

Costs of Available Processes

With all of these facts before him, the process engineer must now estimate the approximate costs of available processes. Before proceeding further, it is usually advantageous to develop the following operating costs:

1. Cost of pumping absorption oil against pressures from 30 to 300 lb.
2. Cost of compressing gas from available suction pressures to discharge pressures from 15 to 250 lb.

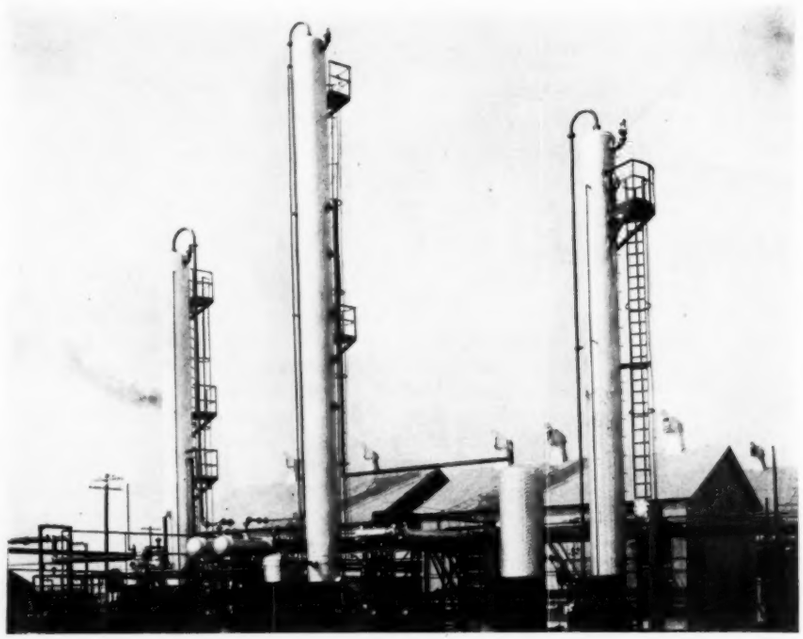
This information should now make possible a preliminary estimate on which can be based comparative costs of different percentages of gasoline extraction from the gas. The controlling factor in most plants is the butane. If the recoverable butane can be used and if its value is considered equal to that of the heavier constituents, then it is usually considered economical to recover at least 90 per cent of the butane in the gas. Occasionally low butane content, low cost of power for pumping oil, low cost of compressing gas, minimum corrosion expense, and other factors reduce the operating cost so that it becomes worth while to recover as high as 95 per cent of the butane, although such a plant may cost 20 per cent more than a plant for recovering 90 per cent. The cost of extracting high percentages of butane varies widely, depending largely on the percentage of butane in the gas and its relation to the percentage of pentane and heavier. The percentage of butane extraction becomes one of the most important factors in the determination of oil circulation, absorber pressure and, in fact, all of the plant design.

G. M. Jackson

Absorption Pressures

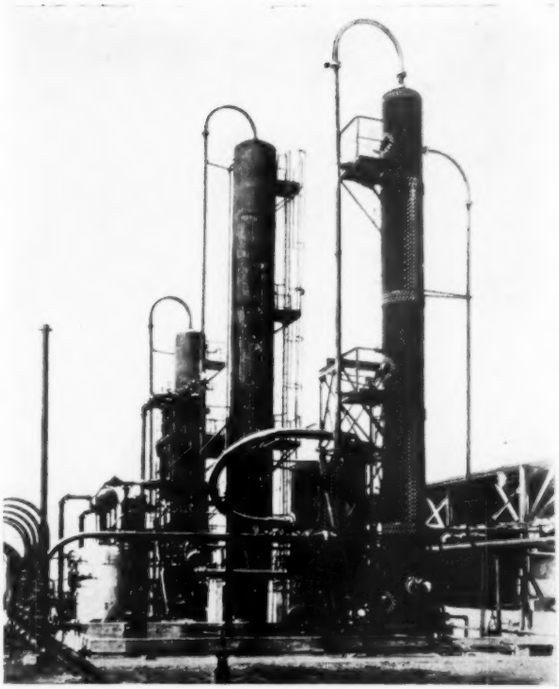
The next important decision to be made is what absorption pressure to use, as the required rate of oil circulation decreases rapidly with increased pressure. Before endeavoring to find the economic point at which the increased annual cost of compressing offsets the saving in the absorption plant, the absorption oil to be used must be definitely determined, as the quantity required, and hence the operating cost and first cost of the absorption plant, will vary widely, depending on the oil characteristics. There is still much to be learned as to the desirable characteristics of absorption oil. The viscosity should be low to promote turbulence and corresponding high transfer rates and low pressure drops in exchange equipment. The oil should be of a narrow boiling range, preferably between 375 and 500 deg. Fahr. The molecular weights should be low, good practice calling for about 180 to 200, as (other conditions being constant) the oil circulation will be approximately proportional to the molecular weight. As unnecessary oil circulation adds to the investment in practically all parts of the plant, as well as the operating costs of pumping, heating, cooling, stripping, and supplying make-up, it can readily be seen that it is worth while to provide suitable oil. It should be kept in mind, however, that the characteristics of the oil may change in service. It is advisable, therefore, to select an oil which can be economically replaced. There is a wide diversity of absorber pressures now in use by our largest refineries, varying from 15 lb. to 250 lb. in recent installations to the author's knowledge. Needless to say, the controlling conditions in the different refineries vary widely and justify the pressures used. The general consensus of opinion, at the present time, seems to be that absorption pressures between 35 and 80 lb. are most economical. The tendency is to use pressures from 60 to 80 lb. for high butane extraction, such as 90 per cent or more, and about 35 lb. for relatively low butane extraction.

Vapor recovery plant and fractionating unit at Sweetwater, Texas.



Distillation Processes

Having determined the butane extraction required, absorption pressure, and absorption oil to be used, in conjunc-



80,000 gal. per day recovery plant and fractionating unit at Port Arthur, Texas.

tion with the other information tabulated. the process engineer is now in a position to definitely calculate the oil circulation and proceed to the determination of the distillation process.

There is considerable variety in the method which may be applied in extracting the gasoline from the oil. If the percentages of methane, ethane, and propane in the rich oil are relatively high, it will usually be advisable to provide a suitable vent to eliminate as much of the light material as possible without serious loss of desired fractions before the distillation takes place. If a large percentage of these so-called fixed gases remains in the oil to flash in the still, their presence in the condensers necessitates high condenser pressure or uneconomical reabsorption. High pressure can be obtained either by high still pressure or recompression. Recompression is fundamentally undesirable if avoidable, as it adds first cost, operating cost, ground space, and an element of operating fallibility which can be eliminated only by installing a spare recompressor at further added cost. High still pressure, if applied to a single-column distillation system, is objectionable because the steam consumption (which varies with distillation pressure) becomes excessive, and exhaust steam, which is frequently available, cannot be used.

One difficulty which frequently complicates the distilling problem is that the butane extracted is often more than all of the heavier gasoline constituents combined. If the oil is distilled in a single column at low pressure (5 to 10 lb.) to make possible the use of exhaust steam for stripping, recompression will be essential to obtain butane condensation at normal temperature. If the oil is distilled at 30 to 50 lb., reabsorption may be applied, but in many cases the circulation required for high butane extraction will be excessive. Recompression may be applied much more economically at this higher pressure than with tail vapors at 10 lb., but the steam consumption of the single high-pressure still is excessive if the oil be thoroughly stripped at temperatures available with steam heating. In such cases a very economical solution is the use of two stills in series, the first one operated at, say, 60 to 80 lb. and removing a large proportion of the lighter ends of the gasoline. This will of course require very little high-pressure steam, and the pressure will insure practically complete butane condensation, particularly if the rich oil has been vented to eliminate as much of the fixed gas as possible. The second still can then be operated at 5 to 10 lb., making possible the use of exhaust steam for stripping the heavy ends. As the light fractions will have been removed in the high-pressure still, condensation in the low-pressure condenser will be complete. In such installations the vent from the high-pressure condensers frequently corresponds closely enough in composition to the rich gas to permit returning it directly to the absorber inlet, thereby eliminating separate reabsorbers or recompressors.

The flow in the stabilizer or fractionating unit, which is practically invariably required for the separation of the propane and lighter constituents from the butane and heavier constituents, offers comparatively little opportunity for variety of method. Care should be taken to provide a constant composition and rate of feed to the fractionating unit, which can usually be done best by installing ample pressure-storage capacity between the distillation unit and the fractionating unit. This will absorb variations in feed composition due to variation in plant-operating conditions. Great care should be taken to provide well-selected automatic-control equipment to govern the quantity of reflux, rate of feed, reboiler temperature, and feed temperature. Needless to say, water should be carefully eliminated from the gasoline feed as its presence will seriously disturb the fractionating-unit operation.

Design of Equipment

Much greater attention should be paid to refinements of design in refinery plants than is usually considered justified for field equipment. As corrosion is frequently severe in the refinery, it is advisable to design all equipment for convenient accessibility and replacement of attacked parts. The relatively small increase in first cost to make the interiors of equipment accessible is easily justified, as equipment can be counted on to remain in useful operation over a relatively long period compared with equipment in field service. Bubble towers should either have removable plates packed into shells or should be provided liberally with manholes for access to the plates. Inasmuch as warping of steel bubble plates of adequate thickness and properly installed is negligible at the temperatures found in recovery plants, there seems to be little to choose between cast iron and steel. Good practice seems to be to use cast iron as much as possible in the construction of bubble caps, throats, seals, down-pipes, and other interior parts.

The exact design of bubble plates seems to make relatively little difference, provided the essentials of good plate design are adhered to. Ample down-pipe capacity must be provided. Particularly in absorbers, ample weir length

or overflow periphery is required to break up the foam and prevent building up above normal liquid level. The number and spacing of plates are of far greater importance than small points of difference in plate design. No greater folly has been committed in the design of absorption plants by equipment manufacturers and refinery engineers than skimping the number of bubble plates in absorbers, stripping towers, and fractionating columns.

Harmful Conditions

In absorbers, an insufficient number of plates inevitably necessitates the circulation of excess oil, resulting in absorption of increased amounts of fixed gases. The addition of these fixed gases sets up a train of harmful conditions including:

1. Increased pressure drop through heat-exchange equipment.
2. Reduction of transfer rate and partial pressure of gasoline constituents in condensers.
3. Increased load on recompressor or reabsorber.

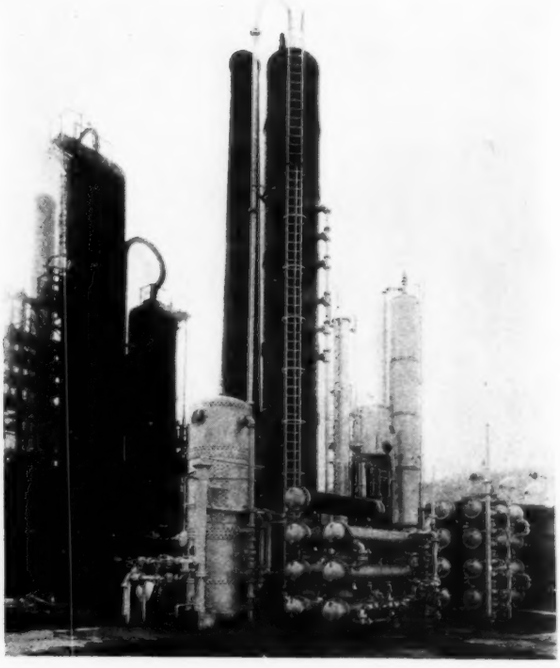
The additional oil circulation increases:

1. Cost of all distillation-unit equipment.
2. Cost of pumping oil.
3. Cost of steam for stripping oil.
4 Cost of cooling water for cooling oil and condensing the added steam.

Compared with all these additional costs, the expense of a few additional plates in the absorbers is negligible.

The number of plates required in absorbers depends partly on plate efficiency, but chiefly on the butane extraction desired. A minimum number of 16 plates is strongly recommended for butane extraction of less than 50 per cent. In general, in refineries desiring high butane extraction, say 80 to 95 per cent, absorbers should have at least 24 plates, and it is the opinion of several excellent refining engineers that as many as 30 plates are justified for the extraction of 90 to 95 per cent of the butane from the gas.

When high saturation of the rich oil may cause extreme temperature rises, say more than 20 to 25 deg., it is sometimes economical to apply intercooling in the absorbers. By maintaining a relatively low temperature throughout the tower, the partial pressure of the butane in the rich oil is kept relatively low. The same partial pressure could be achieved without intercooling only by the circulation of additional oil, as the partial pressure of butane at the base of the column determines the butane extraction from the gas. The reduction of outlet temperature directly results in a reduction of the oil circulation. In extreme cases, intercooling may easily result in a saving of 25 to 30 per cent or even more in oil circulation.



Recovery plant and cracked gasoline unit at Pittsburgh, Pa.

Importance of Stripping Column

To obtain reasonable operating economy, it is absolutely necessary to have a thoroughly efficient stripping column. No matter how perfect the absorbers may be and no matter how much oil is circulated, efficient extraction of the gasoline from the gas is impossible unless the oil is thoroughly denuded. Insufficient stripping plates will necessitate the use of excess direct steam. Most refiners and manufacturers are now agreed that seven or eight stripping plates should be used. The inlet-oil temperature is not highly important, but should be within, say, 20 to 40 deg. of the temperature of available heating steam. The temperature of the oil when contacted with the steam near the base of the column is of far greater importance, as it is the oil temperature at the point where the extraction of the heavy end of the gasoline takes place which controls the quantity of direct steam used. If the quantity of gasoline to be removed is relatively low and if the oil is heavy, it is probably economical to introduce the oil at a temperature within 15 to 20 deg. of available heating-steam temperature, without applying reheating in the column, as in such cases the temperature drop in the column will be relatively small. If, however, the quantity of gasoline to be removed is relatively high and if the oil is light, in which case a considerable amount of the oil will distil off, the temperature on the lower plates should be raised by reheating. As the only purpose in reheating is to reduce the quantity of steam required for stripping the *heavy* ends, it is obvious that the oil should be reheated after the temperature lowering due to distillation of the light ends but before final contact with the steam. This is best accomplished by locating the reheater well down the column, but above at least two or three of the final stripping plates. The practice of heating internally in the column is not recommended. Heating surfaces may require inspection, cleaning, or replacement due to corrosion. With the heater in the still, such work will require a plant shutdown. An outside heater can be bypassed with only temporary reduction of economy due to increased direct steam while the heater is being bypassed.

The rectifying column is of great importance, particularly if light oil is used. The best location seems to be above the still and built into the same tower. Ample rectifying plates should be provided to insure returning all of the evaporated absorption oil to the still with

a minimum of gasoline. Good practice calls for about eight rectifying and control plates. End-point control can be accomplished by pumping back gasoline, by condensation in direct contact with cool water above the rectifying plates, or by the use of a tubular reflux condenser at the top of the column. As there is rarely any place to utilize the heat from the reflux condenser, cooling water is generally pumped through it. This frequently results in the scaling of tubes, and unless a spare is provided shutdown becomes necessary for cleaning. Gasoline pump-back is recommended for the majority of conditions, as final condensers are habitually installed in parallel units insuring regularity of reflux supply.

Two general types of cooling equipment are in use in recently installed recovery plants, both giving excellent results. Open-type atmospheric coolers of the self-scaling type have an undoubted advantage in cases where loose silt or brittle scale are likely to deposit. Closed coolers are sometimes more convenient and compact where ample good cooling water is available. Good practice calls for cooling the circulating oil to within 5 to 6 deg. of cooling-water temperature. As recently pointed out by A. Kremser in a paper before the California Natural Gas Association, 1 deg. Fahr. of temperature reduction corresponds to approximately 2 per cent of saving in oil circulation. This simple relation should be of great assistance to the refinery engineer in justifying the expense of an oil-cooling system designed for a close approach to water temperature. Oil coolers should invariably be installed with bypass to permit cleaning individual coolers without shutting down the plant. Heads or water boxes should be designed with cover plates, permitting access to tubes without breaking pipe connections.

Fractionating equipment is almost invariably justified to make a close separation between propane and butane. Such units should be operated at sufficient pressure to insure the condensation of propane. With operating temperatures such as usually prevail in the United States during the summer, such fractionating columns are usually operated at 200 to 220 lb. per sq. in. gage pressure, but should usually be designed for 250 lb. to provide for relatively high methane or ethane content in the feed. With cold water, this pressure can be reduced somewhat. Such columns usually have 26 to 30 plates; and again the use of the larger number is recommended as giving flexibility to the unit and in case feed is not introduced at the most favorable point by the operator. In many units the reflux condensers are located at the top of the column, but for convenience in cleaning and inspection, coupled with ease of measuring reflux, installation near the ground is recommended, the reflux being collected in an accumulator and pumped back to the top of the column.

The number of columns required and other features of the fractionating unit may vary widely, depending upon the exact characteristics and variety of products required.

Each refinery presents a distinct problem, and there is no single solution which will necessarily give economy. Opportunity should be given to competent engineering authorities to study all the conditions which may affect the plant design. Once determined, the controlling conditions should be thoroughly discussed with an experienced specialist and the process carefully developed to meet the existing conditions. Standardized plants and standard flows should be avoided, and each part of the system made to justify itself from the standpoint of operating economy throughout the probable life of the plant.

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World-Wide Curtailment Collaboration

(Continued from page 552)

products, but caused larger quantities to be put into storage, thus increasing the danger from large inventories. Proration, therefore, is not operating to its logical limits. There is still an enormous quantity of gas wasted and more crude is being produced than the market can possibly absorb. If the wastage of gas were eliminated, it would automatically reduce the production of crude by tens of thousands of barrels a day and bring it nearer to the real limit of demand.

A proper figure should be found as representing the total demand in the country and the industry told clearly what this figure amounts. With crude production fixed at the real figure of demand and not at today's artificial figures, the buyers of crude would then be justified in paying the producer a price for his product which would enable the producer to make a reasonable return on his investment.

In Roumania the Royal Dutch-Shell group took the initiative in a scheme of conservation so that crude should not be produced in excess of the demand and the result so far has been that the producer is receiving an adequate return.

There is one other important factor which must be corrected before the industry can return to so-called normal conditions and that is the control of drilling. Steps have been taken in certain fields to develop a unit plan operation by which lessees combine their interests and develop the field jointly, but the benefits of such a scheme are largely neutralized by these royalty provisions. The unification of royalties upon new structures is just as important as that of leases and although it is a much more difficult and complicated problem, the industry would be well advised to attempt some such plan whenever a wild cat well is contemplated. Useless drilling when the pipeline outlet from new fields is limited to a known and restricted quantity is unnecessary, and particularly under present conditions cannot be justified upon any grounds. Conservation cannot be fully successful until this or a similar plan for the control of drilling has been developed.

Conservation is of necessity here to stay. It is evident that considerable dissatisfaction exists as to the allocation of outlets, and the division of sacrifice throughout the fields. Much care will need to be exercised so that either in respect to exploration or exploitation or in regard to prices, those leaders who are in a position to effect the situation, should weigh with care any decision they may take which will in any respect endanger the conservation movement and lead to further dissatisfaction amongst the promoters.

Happily Venezuelan producers have at last seen reason and are showing definite signs of closer co-operation and reduction in drilling and a substantial reduction in production—all steps in the right direction. There seems no reason to doubt that closer co-operation between the producing countries could result in the world supplies of crude and refined products being brought strictly into line and one can easily foresee that this condition could be brought about within a comparatively short time if larger companies would attack the problem from the point of view of the benefits accruing to the industry as a whole and therefore to them individually instead of from a strictly limited viewpoint of individual and personal gain.

Pointers On Shooting Oil Wells

When To Shoot, What To Shoot, What To Use, and Results of Torpedoing Are All Clearly Outlined By An Experienced Well Shooter.

. . .

By W. H. Jeffery

W. H. Jeffery Company
Toledo, Ohio

THE practice of torpedoing, or "shooting," oil wells to increase their production is nearly as old as the industry itself. Colonel E. A. L. Roberts secured a patent on the process of torpedoing oil wells and applied the new idea to the shooting of wells in the Titusville, Pa., filed in the year 1865. It has since become standard practice in the United States to shoot all wells which derive their production from hard formations. It is not, of course, necessary to shoot large producing wells of the gusher type at completion. Such wells usually are shot, some of them several times, later in their productive life after their flush production has subsided.

It is not customary to shoot dry holes, although the fact remains that some dry holes have been shot into prolific wells. It would seem to be a justifiable expenditure to add the small cost of the shooting to the considerable cost of a deep dry hole if there were only a remote possibility of converting that dead loss into a paying investment.

Usually only the harder formations of Lower Cretaceous or Pre-Cretaceous age are shot. Such formations as the Wall Creek sandstones in Wyoming, of Upper Cretaceous age, are shot with very good results, however. The softer formations of late Cretaceous and Tertiary age in the fields of the Gulf Coast and of California are practically never shot, for it has been found that not only does the torpedoing of these softer formations usually fail to increase the production of the well, but it may actually be detrimental to it.

The "squibbing" of wells producing from sandstone formation is practiced with success in some of the fields of Oklahoma and Texas. This consists of re-shooting the well after its production has declined and, at intervals, repeating the process as long as the well will respond with a profitable increase of production. There have been many instances of very considerable increase in the production of wells as a result of squibbing them. Such increases have been from 20 barrels per day to several hundred barrels per day, and in some cases from a few hundred barrels per day to several thousand barrels per day. Such results have been secured from comparatively light shots; namely, 10 to 40 quarts of nitro-glycerin.

Results of primary shots range from no increase at all to the conversion of a dry hole showing not a trace of oil to a well with an initial production of several thousand barrels per day.

Types of producing formation showing the most favorable results from shooting are the hard Dolomites, the hard but porous limestones, and the hard, fine-grained, sandstones. As the formations grade down to the softer limestones and sandstones the results that may be expected from shooting usually diminish.

What nitro-glycerine did to an oil well.

* Roderick, Ralph, "Tampering and Shooting Texas Wells," Petroleum Engineer, March, 1930.

It is difficult to say just what happens as the result of a shot. It is generally believed that the explosion shatters not only the face of the producing formation; but creates lines of fracture extending back into the formation, thus opening up new drainage channels through which the oil is enabled to enter the well.

Various means have been employed to learn the extent to which cavities have been opened in producing formations as a result of shooting. In several wells that were about to be abandoned, one company placed a quantity of gravel in the bottom of each well sufficient to fill up the hole to the top of the producing formation. The cubical contents of the gravel were calculated, and by deducting an amount equivalent to the cubical contents of the diameter of the drill hole through the formation it was possible to approximate with fair accuracy the size of the enlargement produced by the shot.

Another company, in cementing off bottom water in several of its wells, kept careful records of the quantities of grout placed in each well. By this means the operators were able to approximate the diameter of the holes at each point where top of the cement measurements were taken. Original diameter of wells was 6¼ inches. Enlarged diameters of the three wells were—according to John R. Evans in OIL FIELD ENGINEERING for September 1, 1930—as follows:

Well No.....	1	2	3
Minimum Diameter, Inches..	8.4	13.2	13.2
Maximum Diameter, Inches..	13.2	112.8	31.2
Average Diameter, Inches.....	10.8	37.8	24.24

S. F. Shaw in OIL WEEKLY for October 31, 1930, makes the interesting statement that the enlargement of the diameter of a well as a result of shooting is far more beneficial in increasing the ultimate recovery of oil than the use of back pressure on the well, for the reason that the effect of shooting is to lower the gas-oil ratio. He gives examples from a number of wells showing the effect on gas-oil ratios produced by shooting as follows:

Well	Oil Prdtn. Before Shooting	Bbl. per Day After Shooting	Gas-Oil Before Shooting	Ratios After Shooting
A	335	677	1320	853
C	368	606	1290	881
D	382	854	1923	1518
F	788	1475	600	444
K	206	497	2580	1591

Three types of explosives are used in well shooting operations, liquid nitroglycerin, explosive gelatin, and dynamite. The latter explosive is not used by tor-

pedo companies and is employed to a limited extent by producers who attempt their own shooting of the shallower wells. The liquid nitro-glycerin is the explosive most commonly used, and is perhaps the most powerful. It must be manufactured in proximity to the place where it is used. Explosive gelatin is used with success in the shooting of some of the softer sandstones where comparatively light shots are the rule. It would be available to drillers in fields outside of the United States, as it can be shipped to any point. Some text books on explosives rate the strength of the gelatin at 106.17 as compared with 100 for the liquid nitro.

This has led to some misunderstanding with regard to the relative value of these explosives for well shooting. The explosive for this purpose is placed in tin shells having a capacity of a given number of quarts. Liquid nitro-glycerin weighs 3.25 pounds per quart as compared with a weight of 2.85 pounds for a like quantity of gelatin. Therefore, granting for the sake of argument that the text books may be right, the fact remains that for the purpose of shooting an oil well and using containers of a diameter limited by the diameter of the hole it is possible to place a greater weight of the liquid than of the gelatin in such a space. It is thus possible to use a larger quantity by weight of the liquid nitro and thereby obtain a more powerful explosion.

Nitro-glycerin, $C_3H_5\ (NO_3)_3$, is the product of chemical reaction by treating glycerin with a mixture of 4.5 parts of nitric and 5.3 parts of sulphuric acid. Text books say nitro-glycerin freezes at 43 deg. to 46 deg. Fahr. It begins to congeal between these temperatures, but it still can be poured at a temperature of 40 deg. Fahr. At 38 deg. it freezes hard. It is insoluble in oil or water, but is soluble in chloroform or alcohol.

The quantity of explosive used in a shot is governed by the texture, thickness and porosity of the formation. It obviously is wasteful and futile to shoot unproductive strata above, below or interbedded with the productive formation. Heavy or light shots are regulated by the diameter of the tin containers or "shells" in which the explosive is placed, varying from two to seven inches. One three-inch, five quart shell might suffice to shoot a few feet of porous sandstone in a well in the Seminole pool, as compared with 40 seven-inch, 20 quart shells —800 quarts—for a well in the West Texas Permian limestone with 100 feet of productive formation.

It requires the services of an expert shooter to correctly place a five or ten quart shot exactly opposite five feet of productive stratum near the bottom of a 4,000 or 5,000 foot well. For if such a shot should be misplaced by only a few feet the object of the shot would be defeated. It often is necessary to shoot a lenticular formation, placing the shells containing the explosive opposite the productive strata and bridging the barren spaces between these sands with a loaded anchor, 1¼ inch tin tubing containing sufficient explosive to insure continuity of the shot.

Shooting a glacier oil well in British Colombia

When it is desired to place as large a quantity of explosive as possible in a well, the "dump shot" sometimes is used. This consists of placing in the well sufficient shells of as large diameter as it may be safe to run in the casing to cover the productive formation; then to lower enough more nitro-glycerin in a dump shell to fill up the annular space between the outside of the shells already placed and the wall of the hole. By tripping the dump shell its contents are discharged at the bottom.

The quantity of stemming or "tamping" water that is put in on top of a shot varies with the ideas of the owner of the well. It doubtless is true that the weight of the water serves as a recoil cushion and tends to direct the force of the explosion both downward and laterally into the formation. The use of too much water may have the effect of confining the explosion in the well, or in the vernacular of the shooter "the shot does not come out." When this happens, however, the cause more often is that part of the material that has been broken down by the explosion has lodged in the hole, forming a bridge, which must then be drilled out.

In many wells it is necessary to set the last string of casing just above the producing formation. In such case the level of the stemming water should be at least 15 feet below the bottom of the casing for shots of 50 quarts and less, and 20 to 30 feet below for shots of 60 quarts or more. If the casing is set in the top of, or a few feet above, the producing formation the only safe procedure is to place the explosive in the well, run an electric squib attached to a length of shot firing wire to the top of the shot to maintain a connection to the surface; then to pull all or part of the casing from the well before exploding the shot. Exploding is done by means of a galvanometer or plunger battery. Modern practice, however, except for shallow wells, is to explode such shots by means of one of the several types of time bombs. These are clock actuated devices which may be set to go in from one to eleven hours. One bomb now is available with a 24-hour clock face, and which can be set to go in 23 hours. It is dangerous to set the time of explosion less than one hour in advance.

A Texas company has experimented successfully with a new method of stemming shots placed near the bottom of the casing where there might be danger of the shot damaging the casing. They place a time bomb on the shot set to go after a lapse of about four hours. On top of the bomb they place balls of oakum soaked in water so they will sink through the oil. The bailer then is run on the oakum to pack it down, then more oakum is put in until a depth of three to ten feet has been filled. On top of the oakum from one to two cubic yards of clean river sand is poured. The theory is that the oakum serves as a buffer to protect the casing and the packed stemming seems to create a greater pull or vacuum on the formation as the well cleans itself upon explosion of the shot, thus drawing more oil into the well.

This shot blew the casing out of the well.

The principal objection to this practice is the possibility of failure of the bomb; in such event to clean out the oakum and sand may be difficult and dangerous. An alternative is to dump sufficient nitro-glycerin in the hole to percolate through the stemming material and then to detonate the shot with a jack squib or another bomb.

Nitro-glycerin is a sensitive explosive

and it will explode from frictional contact between metal surfaces or from a severe shock. A few drops of it that slopped over if a cork came out, or that leaked out of a defective can, might get into the springs or brakes of a car and cause an explosion. To prevent this trucks for transporting it are equipped with rubber containers, or "boots," each holding one can of the explosive. Yet it will sometimes burn without exploding, and the U. S. Bureau of Mines conducted distillation experiments with it, and found that in none of the tests did it explode at temperatures lower than 200 deg. Cent. (392 deg. Fahr.) and in some cases as high as 218 deg. Cent. (424 deg. Fahr.) A few drops of nitro-glycerin splattered on the side of one of the tin shells used in shooting wells could, by frictional contact in the casing while being lowered in the well, cause a premature explosion that might wreck the well. It is for this reason that shooters test their shells by first filling them with water to detect leaks, and then pour a pail of water over the filled shell before running it in the well to clean off any nitro that may have spilled down the side.

Miracles happen in the handling of this dangerous explosive. Trucks carrying it have turned over in a ditch and have even been partially wrecked in collisions on the road, with no resulting explosion.

Sensitive as nitro-glycerin undoubtedly is, the fact remains that shooters often experience difficulty in exploding it in a well. Three or four or more jack squibs sometimes are dropped in a well without exploding the shot. In some cases, of course, the jacks fail to explode. Many times the faint crack of the exploding jack is heard, but no explosion of the shot.

Before shooting a well all drilling fluid, mud or emulsion should first be bailed out of it, and sufficient clear water run in for stemming to fill the hole 100 to 200 feet above the top of the producing formation.

In the operation of shooting a well the shooter first ascertains the exact depth of the well, the depth to the top of the producing formation and the thickness of it. He then clamps his torpedo reel with line to the flywheel of the drilling engine and ties a pulley to the drilling stem, set near the hole of a cable drilled well, or to the bailer or a joint of drill pipe placed on the derrick floor of a rotary-drilled well. He then passes the torpedo line, to which a hook is attached, over the pulley and hangs the first shell on the hook. To the bottom of this first shell he attaches enough tin tubing, called anchor, to raise the shell the necessary distance above the bottom of the well to bring it opposite the lower part of the formation to be shot. He then places his hand on the top of the shell and presses down to test the strength of the bail and to make sure the brake on his reel is firmly set.

Next he fills the shell with nitro-glycerin, pouring it from the ten quart cans he has brought out in his truck. He then goes back to his reel, releases the brake and lowers the shell to the bottom by hand. When he has unhooked from the shell, the engine is started and the line is reeled in by the engine until his target, or "flag," tied to the line appears, when the engine is shut down and the remainder of the line is reeled in by hand. The operation is repeated for as many shells as may be required for the shot. The shooter always runs the measuring line on the first and last shell to be sure he has placed them correctly.

Lowering the loaded shells in an ordinary well is merely routine work for

The author and his transportation system.

the shooter. Putting them in a well that makes occasional flows or one with a large volume of gas at high pressure is a job that should be attempted only by an able and experienced shooter. For when a shell is flowed out, which sometimes happens, it usually explodes when it comes in contact with the derrick, with danger to life and the certain destruction of part, at least, of the derrick and drilling rig. Once a shell is landed on bottom in such a well, however, it may be depended upon to stay there.

Shots are exploded in various ways. In the old Ranger, Texas, field it was found that if a shot were left in a well for approximately 72 hours it would "hatch," that is, explode. In northern Ohio the cast iron "go-devil" still is used. A firing head with cap is affixed to the top of the upper shell and the weight is simply dropped on it.

The jack squib is the detonator most used. It is a small tin shell with an inner tube in which is placed about one-half pint of nitro-glycerin with a water-proof fuse with caps extending from the explosive to the top of the shell, which is then packed with sand. The end of the fuse is lighted and the jack is dropped. Other types of squib are the line squib and the bumper squib. The former is lowered on a length of wire. It is fitted with a firing head with caps and a tubular weight is dropped over the wire. The bumper squib also is equipped with caps and a sashweight to which the lowering wire is attached. When the squib comes to rest on top of the upper shell of the shot a quick slacking of the wire causes the weight to drop on the caps, exploding the squib. The bumper is not much used, however, for it has been known to hang up in the casing while being lowered with the result that the weight dropped on the caps, exploding the squib, and also shooting off the casing.

During the past few years the time bomb has come into quite general use for exploding shots in the deeper wells, particularly those where the casing must be pulled. The time bombs are of three types, electrical, using current from dry cell batteries to detonate fulminating caps; mechanical, releasing a hammer on gun caps and mechanical, releasing a hammer on gun caps which ignite a short fuse, the other end of which is inserted in a blasting cap. All use a watch or alarm clock as an actuating mechanism and dynamite as the explosive.

The modern repressuring practice suggests that some interesting experiments might be conducted with the object of forcing nitro-glycerin back into a particularly depleted formation or into a porous formation without showing of oil or gas and exploding it with the idea of opening channels more remote from the well bore than might be possible with an ordinary shot. This might be accomplished by dumping the explosive and then filling up the hole with water and leaving it for a sufficient time for the pressure to force the liquid explosive into the formation. Or a packer could be lowered on a string of tubing to the fluid level of the nitro-glycerin and set there; then compressed air could be turned into the tubing to force the explosive out into the rock. After that had been done, if possible, sufficient more nitro could be dumped, or shells lowered to fill up to the desired point and the shot exploded in the usual way. Explosive often is used in the oil fields for other purposes than stimulating production. By the use of light shots tools are sidetracked, boulders are broken and occasionally a crooked hole is straightened.

U. S. PRODUCTION REVIEW

	Daily Production bbl.	Daily Runs to Stills bbl.	Gasoline Stocks bbl.
Week Ending Oct. 11	2,361,657	2,371,000	37,125,000
Week Ending Oct. 18	2,368,561	2,360,400	36,276,000
Week Ending Oct. 25	2,362,838	2,342,400	36,655,000
Week Ending Nov. 1	2,359,204	2,281,600	37,215,000
Week Ending Nov. 8	2,315,881*	2,274,600	37,012,000

Gasoline stocks considered sufficient at this season—about 25,000,000 bbl. Underlined figures indicate improvement in statistical position:—decrease in production, runs to stills or gasoline stocks.

A GASOLINE DEMAND

* American Petroleum Institute and the Federal Oil Conservation Board estimate the gasoline demand for 1930 and the first quarter of 1931 at the 1929 rate or even lower, thus necessitating the revision of producing and refining schedules. Runs to stills are recommended at 3,210,000 bbl. per day, which figure is above present runs, indicating the cooperation of refiners. The indicated desirable production is 2,240,000 bbl. per day, requiring an additional curtailment of 75,000 bbl. Recommendation vs. present actual runs by major areas are as follows:—

	Recommended Production bbl.	Production Week Ending Nov. 8th bbl.
California	535,000	600,000
Oklahoma	535,000	489,000
Texas	719,000	749,000
All others	451,000	478,000

CRUDE OIL PRICES—STABILIZATION AT REDUCED LEVELS

The radical crude oil price reductions, originating in September and early October, spread over the whole of Mid-Continent area, affecting about 1,600,000 bbl. of daily production, and meaning a loss to producers of about $450,000 per day, not considering the usual inventory losses. The Eastern crude oil was cut also, but not as radically, affecting about 115,000 bbl. of daily production. California and Rocky Mountain fields are the only areas at this time where prices have been maintained at former levels. The general Mid-Continent cut in crude prices was originated by Stanolind Crude Oil Purchasing Co., (Std. Oil of Indiana) on October 25th; this reduction was met gradually by all purchasers, but the prices did not stabilize until November 2nd, when Stanolind reduced Oklahoma-Kansas top grades from 44°Be ($1.19) to 40° Be ($1.07) to meet schedules posted by Humble and Carter Oil Companies (Std. Oil of N. J.). The table showing former and present posted prices in major areas are as follows:—

		Former $	New $	Reduction %
Oklahoma-Kansas	35°Be	1.05	.92	12.4
" "	40°Be	1.43	1.07	25.2
Gray Co., Texas	40°Be	1.265	.92	27.3
West Texas & New Mexico (incl. Hobbs)	36°Be	1.01	.74 (Yates & Winkler .79)	26.8
North & Central Texas (incl. Van)	36°Be	1.29	.95	26.4
Gulf Coast	32°Be	1.24	1.06	14.5
Louisiana-Arkansas	32°Be	1.12	.81	18.7
Pennsylvania-Bradford		2.55	2.30	9.8

Proration

No decisions of major importance have been rendered during the past 30 days, either in Mid-Continent or on the Pacific Coast. In Texas the Sunray Oil Co. joined the ranks of Danciger Oil and Ref. Co. and of Young Bros., by obtaining an injunction, preventing the railroad commission from interfering with its operations in Gray County. This injunction has been sustained in a minor court action.

In Oklahoma and Kansas the Prairie Oil & Gas Co., on November 1st and 10th respectively, initiated a proration of small wells producing in excess of 5 bbl. per day. The notice to producers reads in part: "This plan provides that on all wells producing 5 bbl. or less that we will run one hundred (100) per cent; on wells producing in excess of five barrels we will run a marginal requirement of 5 bbl. and prorate the excess of oil on a 50 per cent basis."

Oklahoma—Oklahoma City

Under present proration the field is averaging about 80,000 bbl. per day ($1.04 per bbl.; average 39 deg. Be.). The Morgan Royalty Co. No. 1 Stout, in Section 2—T11N—R3W, estimated good for 30,000 bbl. per day and only 1½ miles from downtown district of Oklahoma City, broke loose when sand cut its connections and ran wild for three days, drenching the city with crude oil, closing several schools in the vicinity and presenting a most dangerous fire hazard. This wild well, however, made the city realize the dangers of town lot development within the city proper and permits to drill additional wells near the built-up areas are not likely to be granted, the city fire marshal apparently having the power to prevent the drilling of wells considered as an excessive fire hazard. An indirect curtailment of drilling may accordingly take place in sections 34 and 35 of T12N—R3W and in section 3 of T11N—R3W.

New Mexico—Hobbs

The indicated potential production in this field reached 901,255 bbl. from 114 wells on 101 units of 40 acres each. The allowance for the first half of November has been placed at 31,300 bbl. per day, or 3.47% of the potential. Only 27 wells are drilling at this time in the Hobbs pool, and not many new locations are anticipated in the near future due to the reduction of posted crude prices to $0.74.

California—Kettleman Hills

The most constructive step in the producing end of the oil industry during 1930 began to take shape when the operators in the Kettleman Hills appeared to have come to an agreement to operate the North Dome on a two unit cooperative basis. Two unit system has been decided upon because the Standard Oil Co. of California controls about 58% of proven acreage and in the case of one unit operation that company would have absolute control. The plan provides that The Kettleman North Dome Association will include all operators (about 20), with the exception of the Standard Oil Co. of California, the two organizations fully cooperating in very conservative development of the field. The Association will prorate all development expenses and distribute products and revenues on the acreage basis, regardless of any actual development on individual holdings at the present time. This plan is now subject to the approval of the Department of the Interior (U. S. A.) which is interested in about 35% of the acreage included in Association's holdings.

The Kettleman Hills field is the major factor in U. S. A. Its proven area is around 20,000 acres, while its reserves are estimated as being somewhat in excess of one billion barrels. The crude contains about 90% of gasoline, and including the natural gasoline, one barrel of crude oil produced means one barrel of gasoline put on the market.

The present potential production of Kettleman Hills is 75,000 bbl. per day, as compared with actual runs of 24,500 bbl. per day in the week ending November 8th.

BASIL B. ZAVOICO.

World Oil Production

October, 1930

	Barrels (7 Bbl. per ton)
United States (A.P.I.)	73,536,350
Venezuela (Official)	12,141,108
Russia & Sakhalin (Estimate)	11,750,000
Persia (Anglo-Persian)	4,081,686
Mexico (Official)	3,147,353
Roumania (Estimate)	3,000,000
Neth. East Indies & Sarawak*(Est.)	2,700,000
Colombia (Official)	1,725,809
British India (Estimate)	950,000
Peru (Official)	985,665
Trinidad (Official)	884,725
Argentine (Estimate)	800,000
Poland (Official)	414,400
Japan & Taiwan (Estimate)	175,000
Egypt (Private)	156,709
Canada† (Estimate)	137,500
Ecuador* (Official)	132,000
Iraq (Estimate)	50,000
Others(‡Germany, France, Czecho-Slovakia, etc., *estimate*)	170,000
Total	116,751,934

‡ Jan.—Sept. 808,927 bbl.
* Sarawak (Official) 328,230 bbl.
† September (official) 139,947.
* Anglo-Equadorian figures, 114,534 bbl.

U. S. SOVIET RUSSIA PRODUCTION REVIEW

THE original plan of expenditures for the oil industries of U. S. S. R. in the fiscal year 1929/30 calling for 303,000,000 rbls., were revised to 346,000,000 rbls. and later changed to 353,270,000 rbls. This amount was alloted as follows: Azneft 162,820,000; Grozny 80,500,000; Emba 19,300,000; interior plants 18,300,000; Sakhalin 9,400,000; Ural 15,700,000; Uzbekneft 4,380,000; Turkmenneft 1,100,000; Gruzneft 3,000,000; research work 3,000,000; geologic survey 3,100,000; Gyproneft 750,000; sales organization 38,700,000; and all other expenditures 1,050,000 rbls.

These allotments were to be spent for the following items: productive drilling 60,280,000; wildcatting 24,400,000; drilling equipment 39,200,000; production 15,610,000; refining crude oil and gas (including the erection of four pipe stills manufactured in Russia) 93,500,000; pipelines (including preliminary work for the Maikop-Touapse line) 20,195,000; electric power plants 8,580,000; repair shops 2,855,000; transportation 6,710,000; housing 25,325,000; safety devices 2,645,000; fire prevention 2,805,000; geology, science and research 6,705,000 rbls. All other items 44,460,000 rbls.

The following table shows the allotment of expenditures for the petroleum industry in ratio to the expenditure for all industries in Russia for the last five years (in millions of roubles):

Period	1925/26	1926/27	1927/28	1928/29	1929/30
All Ind'stry	811	1,070	1,324	1,650	3,600
Ptrlm. Ind.	147.4	191	219.3	284.8	353.3
Percentage.	18.2	17.9	16.6	14.2	9.8

DURING the first half of 1929/30 only 32.1 per cent of the above appropriations was expended, in seven months 38.2 per cent, and in the first nine months 43.3 per cent of the expenditures were made. Construction and all other operations are not proceeding with the anticipated speed owing to lack of equipment and probably also of organization. However, during the first six months of 1929/30 the Baku-Batoum pipeline was completed, with a capacity of 1,640,000 tons per year, as well as one pipe still at Grozny, which was entirely of Russian manufacture. The following plants are being erected this year a part of which has already been put on stream and it is to be expected that the other part will be ready by the end of this year.

Azneft:

- 2 Jenkins-type cracking units at Batoum.
- 4 Winkler Koch cracking units at Batoum.
- 3 Foster Wheeler kerosene pipe stills at Batoum.
- 1 Foster Wheeler lubricating still at Batoum.
- 2 Badger kerosene pipe stills at Baku.

Grozneft:

- 1 Jenkins cracking unit at Grozny.
- 2 Winkler Koch cracking units at Grozny.
- 1 Foster Wheeler kerosene pipe still at Grozny.
- 1 Foster Wheeler pipe still for deep distillation.
- 2 Winkler Koch cracking units at Touapse.

ALL this equipment should have been in operation by September 1, 1930. The delay is partly due to late arrival of the machinery from other countries, and partly to the lack of necessary equipment and tools in Russia. Lately, however, conditions have improved, and it is expected that all above plants will shortly be put into operation.

The Azneft Oil Trust is building at Baku and Batoum the following plants:

Baku:

- 2 Badger kerosene pipe stills each of 420,000 tons of crude per year, at a cost of 1,800,000 roubles.
- 1 Badger kerosene lubricating oil vacuum installation of 420,000 tons of crude per year for the kerosene division, and 200,000 tons of fuel-oil per year for the lubrication department. The cost is 1,800,000 rbls.
- 1 Kapelushnikov-Shukhov type cracking unit to handle 125 tons of Surakhany fuel-oil per day, with a cracking distillate yield of 45 per cent. The cost of same is 750,000 rbls.
- 1 Pengu-Gourvitch type high vacuum pipe still. Each unit of this double installation to have a capacity of 65 tons of lubricating goudron for the yield of high viscous distillate (E_{100} = 4.0 to 4.3) up to 40-45 per cent. The cost of same to be 375,000 rbls.
- 1 duplicate of above installation to be erected in 1930/31.
- 1 Max Miller installation for bright stocks for 80,000 tons of concentrated Surakhany fuel-oil, which is 40 per cent of the regular fuel-oil from the kerosene still; the yearly production of bright stock to be 40,000 tons. The cost of same 5,000,000 rbls.
- 2 Pipe stills of Russian manufacture for the fractionation of crude oil up to fuel-oil for 420,000 tons of crude oil each per year. The cost of same to be 2,000,000 rbls.

The building plan of Azneft at Batoum comprises the following:

- 1 Thirteen Shell kerosene battery still (already in operation).
- 4 Foster Wheeler type pipe stills.
- 4 Winkler Koch cracking units.
- 2 Jenkins cracking double units.
- 1 Installation for the secondary refining of gasoline with the necessary treating plant for same, as well as all other auxiliary equipment.

The erection of the above plants is not proceeding with the anticipated speed owing to the delays in shipping the necessary parts from abroad. Russian home industries, where many orders have been placed, are overtaxed and are not in a position to make deliveries for months to come. Furthermore there seems to be a scarcity of skilled labor and the goods manufactured are very often of an inferior quality.

ON page 540 is an analysis of arrears in the activities of the various departments of the Azneft as reported by a committee of investigation for the first half year 1929/30.

The said satisfactorily achieved results of refining refer to kerosene and gas-oil, which were produced above the schedule by 2.5 and 13.8 per cent, respectively. There is an underproduction of heavy gasoline of —3.6 per cent and ligroin of —10.4 per cent, owing to the fact that the yield was under the expectation, namely:

	Expected Yield [per cent]	Actual Yield [per cent]
Crude Oil (Lubric)....	5.6	6.2
Bibi Eibat light crude	12.0	11.5
Surakhani.....	6.0	5.5

J. WEGRIN.

FINANCE

Paris

PARIS stock market activity was dull during the whole of the month of October. The influence of the German political situation has made itself very much felt, especially at the beginning of the month, and certain timid French capitalists, like those of other countries, hastened to place their money in safety in the neutral countries. The Swiss banks are said to have received such enormous quantities of money lately that they have refused further deposits. This feeling of insecurity is however wearing off, and capital is returning to France by degrees.

All oil shares, almost without exception, are on the downward trend. There seems little hope of any improvement until the outlook brightens in the United States and in England.

The measures taken in America for curtailing crude production are being watched with interest over here, so much so that Roumania has followed suit, and an agreement between the larger producing companies effectually checked increasing production for a few months. Unfortunately the agreement has not been renewed, and it is most probable that the market will again be flooded with products, and prices will come down with a run.

There has been a good deal of speculation as to the recent presence of Sir Henri Deterding in Paris, but so far nothing is officially known as to result of his visit. He has formally denied that any negotiations had been undertaken by the Royal Dutch with the Spanish Petroleum Monopoly for the construction of a refinery in that country.

Owing to the rumors which have been circulating lately that the French Government and the Iraq Petroleum Co. have come to an agreement with regard to the Mosul pipe-line, and that two separate outlets are to be made—one at Haifa in Palestine and the other at Tripoli in Syria, the shares of the Compagnie Française des Pétroles have risen very slightly since the beginning of the month—after having fallen persistently since the beginning of the summer when the Chamber failed to ratify either of the much discussed Agreements.

The Bourse seems rather more favorably disposed with regard to these shares at the moment.

In a pamphlet recently published by A. L. Jeune, the author shows up the fact that the shareholders of the C. F. P. have not yet increased their capital by even 3% on the shares they have subscribed, and no dividend has yet been paid by the company. This pamphlet appears to have been written for the benefit of French parliamentary circles and the author endeavors to make it clear to them that the French public does not attach much importance to the concessions which the State is prepared to make to the C. F. P. . . . . in all justice it must be said that Mr. Jeune seems to have close connections with the company.

THE Société Française des Pétroles Essences & Naphtes, commonly called the P. E. N., has recently introduced 300,000 shares of Frs. 100 each on the Paris Bourse. It is the first time that these shares have been officially quoted, and follows upon the decision taken by the shareholders of the company at the last general Assembly, to increase the company's capital from 20,000,000 frs. to 50,000,000 frs.

The Société P. E. N. is controlled by Bauer & Marshal, bankers, and was first established in 1920 with the aim of distributing petroleum products in France. The company holds an importing license of 49,000 bbl. per annum, and has made the most astonishing progress during the last four years. Profits amounted to 5,570,678 frs. in 1929, and a dividend of Frs. 22 was paid to preferential "A" shares and of Frs. 12 to ordinary "B" shares.

P. E. N. is an independent company and has no connections with any of the big trusts. It is managed by R. Tatur who is universally recognized as one of the able men in the French petroleum industry. He has succeeded in creating a market for the company's products both in Paris and its suburbs, and in several provincial areas at a time when competition was cut-throat and undercutting a recognized habit.

OIL exploration work is being actively carried on in Morocco by the Cie. Française des Pétroles au Maroc, and great hopes are entertained as to the results of undertakings there.

Several powerful companies as well as the Moroccan Government are interested in the Cie. F. des P. au M., which has already spent 2,009,742 frs. on drilling and preliminary expenses plus more than 611,000 frs. on equipment this year. The company's capital amounts to 5,000,000 frs., entirely paid for.

E. J. ANDRE.

Paris Bourse

Div.	Prix	Nom des valeurs	Cours du 11 Sept.	plus haut	plus bas	Cours du 29 Oct.	Chgmt.
50 lei	500 lei	Astra Romana	142	145	128	124	—18
50 lei	500 lei	Colombia	120	120	101	101	—19
50 lei	500 lei	Concordia	106	107	91	91	—15
	500 F.	Cdré. Gal des Pétroles act	....	....	....	....	....
	500 F.	Cdré. Gal des Pétroles part	7625	7625	6600	6775	—850
	500 F.	Franco Pol. Pétroles act	105	105	96	96	— 9
	500 F.	Franco Pol. Pétroles part	367	370	340	340	—27
1 Frs.	10 Frs.	Franco Wyoming	430	430	406	430	...
20 Frs.	500 F.	S.G. des Huiles de Pétroles act	560	575	494	514	—46
	500 F.	" " part	240	246	230	230	—10
	500 F.	C. Française des Pétroles	....	595	594	594	....
50 Frs.	500 F.	C. Industrielle des Pétroles	995	995	920	960	—35
65 F.	500 F.	Lille Bonnières Colombes prio	1039	1039	980	1004	—35
40 F.	500 F.	" " ord	705	705	640	680	—25
	500 F.	Malopolska act	189	196	189	196	+ 7
40 F.	500 F.	Malopolska part	2040	2040	1660	1820	—220
40 F.	500 F.	Mexican Eagle	....	60	53	57	....
17.50	250 F.	Omnium Inter. des Pétroles	152	152	128	128	—27
50 Frs.	500 F.	Péchelbronn	888	890	850	880	— 8
60 F.B.	500 F.B.	Pétrofina	560	506	506	515	—45
240 fl.	1000 Fl.	Royal Dutch	35200	35200	34050	34700	—500
24 fl.	100 Fl.	Royal Dutch 1/10	3545	3545	3420	3500	—45
5 sh.	1 lg.	Shell	520	528	504	515	— 5
25 Frs.	500 Frs.	Steaua Française	192	202	166	176	—16

London

MOST oil shares quoted in London made new 1930 low records during the past month. Weakness prevailing in all speculative sections of the Stock Exchange, and the unsatisfactory position resulting from price cutting in the U. S. A., encouraged a good deal of short selling. Some weak positions came to light and one small concern active in oil shares failed. A good recovery has since taken place, with exceptionally wide movements all out of proportion to the volume of business transacted.

AT the recent meeting of the Royal Dutch Company at the Hague, J. H. Loudon, chairman, said that a prudent policy enabled the company to show a profit, but would make no prediction on the immediate future of the industry. Referring to the Export Association's cancellation of price schedules, Mr. Loudon stated that it was to be concluded that fresh difficulties awaited the oil industry.

London Stock Exchange Prices

1930 High	1930 Low	Last Year's Div. % per Ann.	Share	October 8 to November 7 First	High	Low	Last	Change
1 1/32	9/16	3½	Anglo-Ecuadorian	21/32	21/32	9/16	19/32	— 1/16
2⅝	1 15/16	22½	Anglo-Egyptian "B"	2 3/32	2 3/32	1 15/16	1 15/16	— 5/32
4 23/32	2 31/32	20	Anglo-Persian	3¼	3¼	2 31/32	3	— ¼
1 13/32	19/32	52½	Apex Trinidad (5s)	¾	25/32	19/32	23/32	— 1/32
2	⅞	....	Attock	1⅛	1⅛	⅞	1 1/16	— 1/16
⅝	5/16	12½	Brit. Borneo (10s)	⅝	⅝	5/16	5/16	— 1/16
11/32	3/16	7½*	Brit. Burmah (8s)	3/16	7/32	3/16	7/32	+ 1/32
¼	1/16	....	Brit. Controlled (5s)	3/32	3/32	1/16	1/16	— 1/32
⅜	3/16	....	Brit. Controlled Pref. (5s)	7/32	7/32	3/16	3/16	— 1/32
4 21/32	3 19/32	30	Burmah	4	4 1/16	3 25/32	4	.....
11/16	⅜	12c	Canadian Eagle (No par)	13/32	13/32	⅜	13/32	.....
1½	1 1/16	....	Creole Petroleum (No par)	1	1	1 1/16	1 1/16	— 2/16
5/16	⅛	....	Kern River (10s)	5/32	5/32	⅛	5/32	.....
2 21/32	1¼	12½	Lobitos	1 15/32	1 15/32	1¼	1 11/32	— ⅛
¾	13/32	6	Mexican Eagle ($4 Mex.)	15/32	15/32	13/32	7/16	— 1/32
68	48½	....	Pan American "B" ($50)	54	54	48½	48½	— 5½
11/16	⅜	5	Phoenix	13/32	13/32	⅜	13/32	.....
35¼	27⅛	24	Royal Dutch (fl. 100)	28 5/16	28 5/16	27⅛	27⅝	— 11/16
4 31/32	3 31/32	25*	Shell Transport	4 5/32	4 5/32	3 31/32	4 1/16	— 3/32
½	9/32	4	Steaua Romana	5/16	5/16	9/32	5/16	.....
3⅞	1 1/32	7½	Trinidad Leasehold	1½	1½	1 1/32	1¼	— ¼
⅜	3/16	....	Utd. Brit. of Trinidad (6s. 8d.)	¼	5/16	7/32	9/32	+ 1/32
3 1/16	1 17/32	20	Venezuelan Oil Concessions	1 19/32	1 29/32	1 17/32	1 25/32†	+ 3/16

Nominal value of shares £1 unless otherwise indicated by bracketed figures. * Denotes tax-free dividend. † Denotes "ex-dividend" price. c—denotes cents per share.

ALTHOUGH considered quite satisfactory, the Burmah Oil interim dividend of 10 per cent did no more than fulfill market expectations. Last year the total dividend was 30 per cent. The company has a large holding of Anglo-Persian shares, from which it should obtain an increased revenue for the current year. It may also have effected further economies in distribution through its interest in the Burmah-Shell Oil Storage and Distributing Company of India. In addition, a large part of its income is derived from its holding of investment securities. In any case, a severe decline in earnings would appear to be required to call for any reduction in the dividend.

DECLARATION of an interim dividend of 5 per cent on the preferred and ordinary shares of Venezuelan Oil Concessions fulfills a promise, made at the last annual meeting, that such a payment would be considered at this time. A single distribution of 20 per cent was made in 1929. Since the end of last year the capital has been increased from £5,400,000 to £7,200,000 by the issue of 1,800,000 new £1 shares to shareholders at par. Payment of another 10 per cent, after the close of the present year is indicated by the directors' announcement that profits probably will be approximately the same as the £1,085,666 earned in 1929. The company is the principal Royal Dutch-Shell subsidiary in Venezuela. It sells its crude under contract to the Asiatic Petroleum and Canadian Eagle companies.

RESULTS achieved by Trinidad Leaseholds for the year to June 30, 1930, were no worse than had been anticipated in view of the passing of the final dividend. The decline of £180,326 to £252,514 in profits provided ample justification for the directors in cutting out the final payment, leaving the interim of 7½ per cent as the total distribution, against 30 per cent for 1928-29. Owing to the smaller distribution, the earnings for the past twelve months provide £70,000 for income tax and a transfer of £75,000 to reserve, increasing the total of that fund to £225,000. The report states that in order to offset as far as possible the effect of lower oil product prices on revenue, substantial amounts were expended on capital account during the year, principally on installation of revenue-producing plant and the provision of improved selling facilities. The funds required were provided entirely from the company's cash resources. Capital expenditure on property account amounted to £398,637. The company recently purchased a petrol distributing business in this country, and will shortly introduce its own motor spirit under the trade name of "Regent" which it acquired.

BY issuing an advance statement on the results for the past year, the board of Apex (Trinidad) Oilfields took an obviously wise course. The company sells its output to Trinidad Leaseholds, for refining, and the passing of the final dividend by that company, coupled with the failure of a Stock Exchange firm interested in Apex shares, left the market in the latter rather jumpy. It was suggested that no final dividend would be paid for the twelve months to September 30; but the directors announced that production slightly exceeded that for 1928-29, and that the customary statement of profits and final dividend will be issued to shareholders during December. The company paid a total dividend of 52½ per cent on its 5s. shares for the year to September 30, 1929; but reduced its interim in July last from 22½ per cent to 15 per cent.

KERN River Oilfields of California (a British concern) shows a recovery in output and an advance from £103,033 to £208,616 in gross profits, but is again unable to provide shareholders with a dividend. The earnings now shown include those of all subsidiaries. After writing off £221,357 for depreciation, the result of operations for the year to May 31 is a reduction in the balance carried forward from £123,283 to £85,008. The heavy depreciation allowance was partly explained at the annual meeting, when the chairman referred to an arrangment with county authorities in California, whereby the company's heavy oil was being used for road work. This had necessitated heavy capital outlay on pipe-lines, tanks and tank lorries.

TRINIDAD Central Oilfields is another company which increased its production during the past financial year without providing shareholders with any cash return. Output for the twelve months to December 31, 1929, was 144,086 bbl. an advance of 90,568 bbl., but the increase consisted almost entirely of heavy oils, and total income was only slightly higher

at £110,543. Allowance for depreciation left the company with a net loss on operations of £3,715, against a deficit of £21,542 for the preceding year. There is now a debit of £30,041 at profit and loss account. This company was registered in 1917, and has an issued capital of £575,788. Dividends at the rate of 10 per cent were paid for 1919 and 1920, but nothing has been forthcoming since the latter year. The total output has never been sufficient to repay development costs. The chairman expressed the hope of better results from the Guapo area, where deeper drilling is projected.

A. H. DAY.

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New York

CONSISTENT weakness in practically the entire market during the latter part of October and early November was accentuated among the oils because of widespread price cutting throughout the mid-continent and eastern sections of the country in both crude and refined products. Sentiment in this group was not improved by announcement on November 7 of cancellation of all price schedules of the Export Petroleum Association, which subject I have discussed elsewhere in this issue. During the week of November 10 to 15, however, the market staged a complete about-face and showed sustained strength from Monday afternoon on. The change was initiated in the copper group as a result of the constructive desire among producers representing over 90 per cent of world output to curtail production by about 20,000 tons a month, enough to balance supply with demand and thus pave the way for reducing excessive stocks.

PURE OIL COMPANY failed to declare the quarterly dividend of 37½ cents a share which would have been payable January 2, because of unfavorable conditions in the industry and the desire to conserve cash resources. In its fiscal year ended March 31, 1930, the company earned $1.52 a share, barely covering the $1.50 dividend rate.

CONTINENTAL OIL reported net before Federal taxes for the nine months ended September 30 equal to 84 cents a share in comparison with $1.41 earned in the same period of 1929. The fourth quarter very likely will be unsatisfactory from an earnings' standpoint, but the company is very strongly sponsored financially, and has cash and equivalent equal to about $18,400,000, or nearly $4 a share.

New York Stock Prices

1930 High	1930 Low	Current Div. $ per Annum	Stock	October 14 to November 15 Sales (Shares)	First	High	Low	Last	Net Change[1]
51⅜	18⅝	†2.00	Atlantic Refining (25)	149,000	25⅛	25⅝	18⅝	23	— 2
34	12⅝	2.00	Barnsdall "A" (25)	141,100	17⅛	17⅛	12⅝	14¾	— 3⅛
8¼	2⅝	....	Colon Oil (No)	11,400	2¾	3¼	2¾	2¾	+ ⅛
30½	10	....	Continental Oil (No)	205,500	13	14⅞	10	12⅞	— ⅝
7⅝	3⅜	....	Creole Petroleum (No)	76,600	4⅛	4⅜	3⅝	3¾	— ⅛
166⅞	75	1.50	Gulf Oil Corp. (25)	70,200	90½	92⅞	75	80	—11
119	69¼	2.00	Humble Oil & Ref. (25)	42,700	74½	75⅞	69¼	72	— 3
30	15⅞	†1.00	Imperial Oil, Ltd. (No)	80,200	16⅜	19¾	15⅞	18⅝	+ ⅛
28⅝	3¼	....	Indian Refining (10)	478,200	8⅛	8¾	3¼	4¼	— 3⅝
24	13⅜	1.00	International Petr. (No)	97,700	14⅜	15⅜	13⅜	14¼	— ⅝
37	9¾	....	Mexican Seaboard (No)	223,500	16	17½	9¾	13⅝	— 3⅛
32	16¼	2.00	Ohio Oil (No)	257,600	22⅛	23	16¼	20	— 3
67½	41	....	Pan Amer. P. & T. B. (50)	18,100	48½	49½	41	44	— 5½
44¾	16⅜	**2.00	Phillips Petr. (No)	218,800	22⅛	24¾	16⅜	20¾	— 2
54	18½	2.00	Prairie Oil & Gas (25)	40,100	26⅞	27½	18½	21¾	— 5¼
27¾	10¾	....	Pure Oil (25)	167,400	16½	17	10¾	11½	— 5
28¾	5⅞	....	Richfield Oil (No)	114,400	7⅞	8¾	5⅞	6¾	— 2¼
56½	38⅝	*3.20	Royal Dutch (N.Y.) (13⅓)	129,300	43	45⅝	38⅝	41⅝	— 2⅝
25½	7½	....	Shell Union (No)	116,900	10¼	10⅞	7½	8⅝	— 1⅞
32	11⅜	2.00	Sinclair Consol. (No)	392,900	15⅛	15⅝	11⅜	13⅜	— 2⅛
42	10¼	2.00	Skelly Oil (25)	44,400	20¼	20¼	10¼	15⅝	— 4⅜
75	49¼	*2.50	Standard Oil of Calif. (No)	160,000	52⅜	54⅜	49¼	51	— 2
59⅜	35⅛	2.50	Standard Oil (Ind.)(25)	277,500	42½	43	35⅛	37⅞	— 4⅞
40½	20⅛	†1.80	Standard Oil (Ky.)(10)	57,000	26⅜	27⅛	20⅛	24⅝	— 2
84⅞	49	†2.00	Standard Oil (N.J.)(25)	941,200	55⅝	59⅜	49	54⅜	— 2¼
40¾	25	1.60	Standard Oil of N. Y. (25)	227,800	27	27¾	25	26¼	— ¾
70	49⅝	††1.00	Sun Oil (No)	13,900	52⅛	56½	49⅝	51	— 1¾
60½	35	3.00	Texas Corp. (25)	271,700	44	44¼	35	38½	— 5½
17¾	8	0.60	Tide Water Assoc. (No)	209,100	10	10⅞	8	9	— 1
50	25⅛	‡2.00	Union Oil of Calif. (25)	51,900	32½	33	25⅛	27⅝	— 4¼
97⅞	59½	†4.25	Vacuum Oil (25)	98,900	66¼	66½	59½	64⅞	— 1⅝
4⅛	1¼	....	Venezuelan Petr. (5)	14,000	1⅞	1⅞	1¼	1⅜	— ¼

[1]Since close of last month's table. * Paid last year—no regular rate. ** Plus 5% in stock. † Including extras ‡ Plus 4% in stock. †† Plus 9% in stock. * Plus 2% in stock.

PROFIT after all charges of Phillips Petroleum for the first three quarters of 1930 was equal to $2.60 per share, more than covering the $2 cash dividend rate for the entire year. Assets of Independent Oil & Gas have been taken over in exchange for Phillips stock to an amount equal to 76 shares for each 100 Independent shares outstanding.

TEXAS CORPORATION has made an offer to acquire Indian Refining through exchange of stock on the basis of one share for each eight Indian shares deposited on or before December 15. Deposit of 75 per cent of Indian common is required to make the plan operative, although Texas has reserved the right to declare the offer binding when 51 per cent or more has been deposited.

THIRD quarter net of Shell Union after charges amounting to $1,107,000 represented a decline of 61 per cent from the second quarter and compares with net of $9,172,000 for the third quarter of 1929. It was, however, a considerable improvement over the first quarter of this year when a loss of $3,155,000 was shown.

IMPERIAL OIL, LTD., of Canada, declared an extra cash dividend of 50 cents a share from accumulated earnings payable December 1, in addition to the regular 25-cent quarterly disbursement. Standard Oil (New Jersey), as owner of over 70 per cent of Imperial's capital stock, will be the largest beneficiary and will receive extra cash revenue equal to about 37 cents a share on its own stock.

ALTHOUGH Standard Oil of New York does not issue interim earnings reports, a recent statement by the president revealed that for the nine months ended September 30 volume of sales was the largest in the company's history. The company has more than $45,000,000 in cash and equivalent, equal to about $2.50 per share of capital stock.

STANDARD OIL OF CALIFORNIA inaugurated a policy of issuing quarterly earnings statements by reporting net for the third quarter of $10,717,039, against $14,267,149 for the same quarter of 1929, and net for the nine months of $30,435,563 against $34,375,480 for the same period of last year.

VACUUM OIL has declared an extra dividend of 25 cents a share in addition to the regular quarterly distribution of $1 a share, both payable December 20 to stock of record November 29. Statement issued by the company indicates that earnings have been well maintained.

C. C. BAILEY.

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COMMERCE

Aden

IMPORTS of petroleum products into Aden are chiefly from the United States, Iraq, and Egypt. Fuel oil, which is furnished chiefly by Iraq, greatly predominates in the import figures; the destination of this fuel oil does not appear from the reports at hand.

Product	Imports 1928/29 (bbl.)	Imports 1929/30 (bbl.)	Exports 1928/29 (bbl.)	Exports 1929/30 (bbl.)
Gasoline	8,567	11,200	1,390	1,959
Kerosene	16,827	14,632	4,825	5,125
Lubc. oil	1,691	2,991	....	....
Fuel oil	2,213,041	1,594,941	....	....
Other oils	2,721	.....	837	917

Algeria

GASOLINE and kerosene were the chief petroleum products figuring in the Algerian trade during the first half of 1930. By far the greater part of these imports are furnished by countries other than France.

Product	Imports	Re-Exports
Gasoline, (bbl.)	472,731	1,505
Kerosene (bbl.)	162,716	328
Lubc. oils, (bbl.)	65,457	969
Gas oil, (bbl.)	27,043	3,472
Fuel oil, (bbl.)	30,776	1,094
Paraffin wax, (lb.)	189,654	.....
Petroleum greases, (lb.)	108,025	.....
Other petroleum prdts., (bbl.)	185,209	.....

Argentina

IMPORTS of petroleum products have shown a steady if moderate increase during the past three years. Consumption of fuel oil is especially on the up grade. Domestic production is increasing, but not so fast as consumption.

Products	Imports 1927 (bbl.)	Imports 1928 (bbl.)	1929 (bbl.)
Crude unrefined	1,355,162	2,222,265	3,415,883
Crudes & fuel oil	4,555,870	5,614,917	6,955,726
Gasoline	2,317,695	2,506,534	2,673,721
Kerosene	561,703	383,217	464,629

Bolivia

THE Bolivian petroleum trade in 1928 and 1929 consisted mostly of imports, the greater part of which came from the United States. Fuel oil and mineral waxes appear to be the two largest items.

Imports	1928	1929
Crude Petroleum (bbl.)(1)	159,967	209,690
Gasoline, (bbl.)	45,236	53,139
Kerosene, (bbl.)	9,324	13,360
Lubc. oil, (bbl.)	18,888	16,957
Paraffin and waxes, (lb.)	2,858,806	2,143,824(2)

(1) Probably means fuel oil; (2) totals for first six months; details not available.

Brazil

MORE than two-thirds of the total quantity of refined petroleum products imported into Brazil in 1929 came from the United States. On the other hand, two-thirds of the fuel-oil consumed in the country was furnished by Venezuela.

Imports	1929
Gasoline, (bbl.)	2,495,818
Kerosene, bbl.)	908,729
Lubc. oils, (bbl.)	317,546
Fuel oils, (bbl.)	2,309,379
Paraffin wax, (lb.)	2,689,041
Lubricating grease, (lb.)	4,320,401

British Honduras

ONLY two countries figured in the statistics showing imports of petroleum products into British Honduras in 1929, the United States and Mexico. More than half the gasoline, kerosene, lubricating oil and greases was furnished by Mexico, whereas the United States delivered most of the fuel oil.

Product	Imports	Re-exports
Gasoline, (bbl.)	17,403	3,914
Kerosene, (bbl.)	9,644	1,226
Lubricating oils, (bbl.)	1,399	63
Fuel oil, (bbl.)	4,085	2,186
Greases, (lb.)	37,851	445

British Malaya

EXCEPT in the item of grease the United States played a very minor role in the direct petroleum trade of British Malaya in the first four months of 1930, the predominant sources of supply being Sumatra, Sarawak, and Netherlands Borneo. The chief customers were Australia and South Africa.

Product	Imports (4 months)	Exports (4 months)
Gasoline, (bbl.)	462,734	952,325
Kerosene, (bbl.)	510,933	323,066
Lubricating oil, (bbl.)	48,346	9,675
Fuel oil, (bbl.)	1,364,921	244,163
Other mineral oil, (bbl.)	21	206
Grease, (lb.)	1,092,672	204,176
Paraffin wax, (lb.)	1,176,000	53,760
Asphalt and bitumen, (M. tons)	5,481	354

Canada

STATISTICS for the first half of 1930 show large imports of crudes, more than 80 per cent coming from the United States, the rest chiefly from Peru and Venezuela. Exports were on a small scale, predominantly to the United Kingdom.

	Imports (6 months)	Exports (6 months)
Crudes, (bbl.)	14,638,276	285,421
Fuel oil, (bbl.)	270,263	.....
Kerosene distillates, (bbl.)	60,369	24,407
Gasoline, (bbl.)	1,917,283	107,684
Lubricating oils, (bbl.)	249,237	.....
Other oils, (bbl.)	4,591	3,840
Paraffin wax, (lb.)	1,908,758	524,304
Paraffin candles, (lb.)	207,730	.....
Axle Grease, (lb.)	2,936,783	.....

China

IMPORTS of gasoline into China during 1929 showed a slight increase over 1928; but on the other hand imports of kerosene showed a decrease.

Imports	1928 (Bbl.)	1929 (Bbl.)
Gasoline	479,260	518,442
From United States	205,592	304,271
From Dutch Indies	159,229	9,482
From Straits Settlement	49,247	119,138
Kerosene	6,266,977	5,833,545
From United States	4,849,729	4,007,453
From Hong Kong	817,094	687,276
From Dutch Indies	394,582	967,007
From Russia	62,050	27,368

United Kingdom

THE total quantities of crude and refined petroleum products imported into Great Britain and Ireland in 1929 are provisionally announced as follows:

	Imperial Gallons
Crude Petroleum	487,634,045
Of which consigned from Persia	339,802,123
Petroleum Oils, Refined.—	
Lamp oil	255,141,533
Motor spirit	810,020,637
Spirit, other than motor spirit	25,507,083
Lubricating oil	97,969,183
Gas oil	113,940,494
Fuel oil	406,696,466
Other sorts	595,488

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Petroleum Imports Into the United States

ACCORDING to figures collected by the A. P. I. the imports of petroleum into the United States during October, 1930, averaged 258,548 bbl. per day, as compared with a daily average of 280,867 bbl. in September. Total imports for the two months are as follows:

	October (Bbl.)	September (Bbl.)
Crude	4,763,000	5,236,000
Gasoline	1,361,000	1,511,000
Kerosene		35,000
Gas oil	187,000	60,000
Fuel oil	1,704,000	1,584,000
Total	8,015,000	8,426,000

DR. O. W. WILLCOX.

SHIPPING

London

THE latest returns of Lloyd's Register of Shipping well show the increase in tanker tonnage that has taken place, not only in the last quarter, but the last few years. When this is added the increase in speed, hence carrying capacity per individual tanker now possible by the supercharging of Diesel engines which propel many such ships, and also by the extra loading which the new Freeboard Regulations will permit, it will be seen that the world's tanker fleets are likely to be in a very efficient position to deal with any demands that oil industry is likely to put upon it in the near future.

THE total number of tank vessels under construction in the world as at September 30 of this year is 135 with a total gross tonnage of 1,034,144 tons. Of this total Great Britain contributes the largest amount, having in all 69 vessels with a gross tonnage of 540,318 tons, Germany comes next with 15 tankers with a total tonnage of 128,545, Holland is next with 13 ships with a total tonnage of 75,900, Sweden comes next with a total of 12 ships with a total tonnage of 90,550 tons, and America follows with a total of 8 with 67,500 gross tons. There then follow in order of numbers —Spain with 4, Japan with 3, Denmark with 5 and Norway with 1. Of course, many of the European flag ships are actually American owned, built for subsidiaries to secure the benefit of low cost construction and operation.

One fact emerges from this report, and that is the overwhelming preponderance of motor-driven tonnage in this class of ship. Of the total of 135 of all types under construction no less than 122 with a gross tonnage of 903,144 are motor tankers, while only 13 with a total tonnage of 131,000 are steam. Denmark, Holland, Italy, Japan, Norway, Spain and Sweden have no steam tanker tonnage building at all. America has four steamers with a total tonnage of 31,900 and four motor vessels with a total tonnage of 35,600.

The American contribution to the steam side is particularly interesting in view of the fact that one of these ships is the G. HARRISON SMITH which inaugurates a new technique in tanker construction in that her boilers operate at 375 lbs. steam pressure and that she has geared turbine drive. Much can be said as to the merits or demerits of this type of propulsion for tanker work, and there seems to be a feeling amongst a number of tank shipping people in this country that the use of high pressure for ordinary knockabout work such as a tanker is subjected to, might in all probability place rather severe maintenance duties upon the operating crew.

THE G. HARRISON SMITH comes from the Federal Shipbuilding Co. of Kearney, New Jersey, and has been built for the Standard Shipping Co. She is one of three vessels with high-pressure steam propulsion, and they are expected to have a speed of about 14 knots. Whether such a high speed is necessary when engaged in coastwise service is a matter which may be open to debate.

If this speed can be accomplished with only small increase in first cost over the first cost of a ship with "average" power plant, or if, on the other hand, the speed can be increased as is the case in the new Anglo-Saxon tankers with continuous supercharge without any increase in fuel consumption, then there is no doubt that it has an economic justification.

IN spite of the fact that the motor tanker appears to be in overwhelming preponderance, it is worth noting that the steam side of the question is not without its adherents and is not by any means standing still. The choice of machinery for a tanker is one which is of more intimate concern to actual tanker owners, than to those owners who are merely concerned with chartering, for most of the charter construction is on a credit basis and it pays the shipyards to offer to owners a standard tanker with standard Diesel engines in which operating costs are low.

Completions

AMONG such tankers recently completed mention should be made of the AASE MAERSK, a ship whose chartering was mentioned in these notes some few months ago. The ship has a deadweight tonnage of 9,000 tons on a draft of 25 ft. 9½ in. She has been built to the order of the Svendborg Steamship Co., which is a subsidiary of the A. P. Moller Group of Copenhagen. She is a single-screw vessel capable of 11½-12 knots.

AMONG ships launched and completed mention may be made of the PAN NORWAY, built by Swan Hunters for A/S Arnstein of Oslo, a 13,500 tanker with a motor engine. The same company also put in the water a few weeks ago the CORDELIA, a similar vessel of 11,000 tons carrying capacity. It is to be remarked that this firm, Swan Hunter & Wigham Richardson, launched three large oil tank motorships in four days, two for British owners and one for Norwegian account.

GOTAVERKEN in Gothenburg are now completing one of their standard vessels of 11,400 tons for heavy oil carrying. This is a twin-screw vessel and is due for completion early this month in order to enter a 10-year time charter in the service of the Anglo-Saxon Company. Soon after the launch of this ship, which is called NORDANVIK, the 9150-tonner STRIX built for the Diesel Tank Shipping Co. of Oslo was taken out on trial.

Most of these launches, of course, concern charter and tramp tonnage. It is interesting therefore, to be able to record the launch of a "liner tanker" for the British Tanker Company, the BRITISH SCIENCE one of the first of the new programme of this Company. She carries 10,300 tons deadweight and has a 11¼-knot speed, her moulded dimensions being 440 ft. x 59 ft. 3 in. x 33 ft. She is Diesel propelled by a single Doxford opposed-piston Diesel of 2850 s.h.p.

On the occasion of the launching of this vessel, which was carried out by Sir Hugh S. Barnes, a director of the Anglo-Persian Oil Company, the statement was made by Sir Hugh that towards the end of this year the world's total tanker tonnage would be approximately 12,000,000 tons, and according to enquiries he had made, he had every reason to suppose that if the usual 10 per cent increase had taken place in the demand for oil, the tonnage would have been absorbed.

Contracts

AMONG recent contracts is one which has been booked by Swan Hunter for a 14,000-tonner for American owners.

A. C. HARDY.

The Foreign Oil Legion

SIR ALEXANDER W. PRINCE has been elected chairman of the Trinidad Petroleum Development Company, the position until recently being occupied by Sir Richard Barnett, who we regret to say lately passed away, and who was one of the first subscribers to WORLD PETROLEUM.

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W. B. LUCAS, engineer with the Iraq Petroleum Company, is studying American oil field equipment in oil fields of the United States prior to returning to headquarters.

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JUDSON WOOD, chief of the Venezuela Gulf Oil Corporation's legal department in Colombia and Venezuela, recently returned to the company's Bella Vista terminal at Maracaibo following a three months' vacation in Europe.

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D. H. Caddell, the genial field-superintendent for the Venezuelan Gulf's Cabimas field.

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J. A. TONG, geologist, Standard Oil Company of New York, recently arrived at Maracaibo. Mr. Tong was formerly on the staff of the Venezuela Gulf Oil Corporation.

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ENRIQUE AGUERREVERE, attorney at Caracas for the Paraguana Petroleum Corporation, and who was one of the informal committee negotiating with the Venezuelan Government on the new Reglamento, recently visited the oil fields in the Maracaibo Basin.

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WILLIAM PIEZ, who in 1928 went to Europe as representative of the Link-Belt Company, and who is a brother of Charles Piez, chairman of the board, died of pneumonia at Brussels, Belgium, on November 2nd after a week's illness.

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B. A. THOMPSON, petroleum engineer for the Burma Oil Company, is touring the United States studying American oil field equipment and methods.

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DR. H. M. E. SCHURMAN, chief geologist of the Bataafsche Petroleum, Maatschappij, The Hague, Holland, attended the A. P. I. meeting in Chicago, after visiting the mid-continent oil fields.

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E. A. SATCHELL, formerly with the Lago Petroleum Company in Venezuela, is on a visit to the Iraq oil fields, but his headquarters will be at the London office of the Iraq Petroleum Company.

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HAL B. GREER, manager of the Venezuela Sun Oil Company at Maracaibo, recently married Ethel Bedwell, nurse at the Venezuela Gulf Hospital, Bella Vista.

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W. W. COLE of the Byron Jackson Company has completed his year's trip through the oil fields of the world, and is now home in Los Angeles. He went to Japan, Dutch East Indies, Burma, India, Persia, Iraq, Roumania, Poland, Germany, England, and South America. Quite an ambitious program.

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CAPTAIN K. BRANDWYK NODELYK, of the Colon Development Co., Ltd. (Royal Dutch-Shell) Maracaibo, Venezuela, recently returned from his vacation in Europe. He writes: "I had the greatest pleasure in finding a whole bunch of issues of WORLD PETROLEUM awaiting me. Using a free Sunday and a few cool evenings I finished reading these six beautiful publications, and felt really sorry that no more were available."

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HARRY D. DIETS, co-publisher of the MARACAIBO HERALD in Venezuela, the only English language newspaper in South America, is taking his first vacation in ten years, visiting Mexico and the United States of America. He is well known to international oil men in the Venezuelan fields.

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DR. FRITZ TER MER, director of the J. G. Farbenindustrie A. G., developer of the hydrogenation of petroleum refining, arrived in the United States from Germany on November 11th.

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F. GODBER, director of publicity of the Asiatic Petroleum Company, the marketing organization of the Royal Dutch-Shell group, recently arrived in the United States from London to attend the A. P. I. meeting at Chicago where he gave an address, offering to cut Venezuelan crude production if other major operating companies would agree to do likewise. He sailed again Dec. 21st.

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J. C. TEMPLETON, managing-director of the International Geophysical Prospecting Company, has been visiting the Maracaibo Basin oil fields.

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JOHN S. RIDLEY, chief of correspondence of the Caribbean Petroleum Company, Maracaibo, has just returned to Maracaibo from London following a four months' vacation.

John H. Ridley, chief of correspondence for the C. P. C. at Maracaibo.

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WM. MCKELLER, personnel manager of the Venezuela oil concessions, has been on vacation in Venezuela prior to leaving for a trip to England and Scotland.

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THIS international page is for the purpose of keeping oil men who travel in constant touch with one another. WORLD PETROLEUM will be glad to receive, prior to the 15th of each month if possible, movements of oil company officials in all parts of the World.